THE IRON TRADE REVIEW

VOLUME XXXIV. CLEVELAND, O., APRIL 4, 1901. NUMBER 14

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

In the midst of changes and projected changes of more momentous import perhaps than even those in the highest places can appreciate, the iron trade is steadily at work making 1901 the greatest year in its history. At New York, which is more than ever the center of power in the steel world, there have been several developments of interest. The announcements of the officers of the United States Steel Corporation, of the formal absorption of the American Bridge Co., and of the purchase of further iron ore properties, accompanying surprisingly large dealings in the unissued stock of the new consolidation, have been an impressive initiation of a regime whose future wil command a large share of the world's attention. So far as the iron market of today is concerned, the coming in of the United States Steel Corporation is not in evidence as a trade factor, beyond the delay it has caused in the fixing of prices for Lake Superior ores. It is not known, indeed, what properties will appear in the list of merchant mines when the big corporation is through buying. Two groups of such mines are understood to be under option, one to the promoters of the Mahoning and Shenango Valley furnace consolidation. The fact that the Morgan company is likely to be a considerable buyer of old-range ore, as it is a heavy seller of Mesabi ore, gives it a double interest in the price to be established and is expected to insure moderation. There is throughout the trade a very evident unwillingness to put prices up. With the possible exception of non-Bessemer pig irons it is conceded that all products are on a basis guaranteeing a prosperous scale of profits. Any action that looks to higher prices simply because they can be enforced, even at the risk of curtailing consumption, will be viewed with utmost disfavor. But such an inclination does not appear. The heavy responsibilities that go with power are appreciated, it is believed, and further, the instinct of self-preservation is strong even in corporations of unheard of size. The Bessemer pig iron market has reflected the prevailing conservatism, in the sales that have been made at $15.75 at Valley furnace for delivery after July 1. Another important consumer of Bessemer iron—the Crucible Steel Co. of America—announces plans for two modern blast furnaces that will make it independent of the Bessemer merchant furnaces. Labor cost to Valley furnacemen has been raised again, the demands of the men being granted in the week, resulting in a higher wage than was ever paid on the present level of pig iron prices. Foundry iron markets have been active, and orders for delivery in the second half of the year are now on furnace books in large volume. It is plain that consumption is now at the highest rate the country has known. Foundries of nearly all descriptions are contributing to the increase, and even the stove manufacturers, who have found cause for thinking a wage reduction was necessary, have agreed to the old scale for another year. The most significant fact in connection with finished material is that mills which have not run for months, and some of which were scarcely expected to be active again, have been started up. This is particularly true in bars, sheets and pipe. Rail mills are so well sold that foreign business is not being sought, as in the closing months of last year. London agents representing other American products have been notified that foreign business is not be gone after for delivery in the next few months. The structural demand is assuming prodigious proportions, and it can be seen that the rush of specifications later in the season may easily duplicate the conditions in 1899 in this trade. The new bar mill at Duquesne is expected to be running by July 1, but the significant fact is that all its output will be taken by the American Bridge Co. In all lines the prices of the week are substantially without change from the preceding week.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, }
429 PARK BUILDING, April 3. }

The blast furnace capacity of this district is to be still further increased during the present year by the erection of two furnaces with a daily capacity of 1,200 tons, by the Crucible Steel Co. of America. This large steel producer will be practically independent of the market when these furnaces are completed and the furnaces in the two Valleys will lose one of their largest buyers. The decision of this company to become independent of the pig iron market has not yet affected the proposed consolidation of the furnaces in the Mahoning and Shenango Valleys and at the present time the promoters have options on nearly two-thirds of the properties. Everything looks very favorable for the consummation of the deal, though probably not all furnaces will be included. The furnace workers in the Mahoning Valley have secured the advance in wages which they asked for several weeks ago, placing their present scale above that paid when pig iron was much higher than it is today. Following the example set the employes of the furnaces the Shenango Valley are also asking an advance and have notified the furnace operators that they want the same wages that are being paid in the Mahoning Valley, granted them by April 5. It is probable that a compromise will be effected.

General market conditions continue very strong. There is no apparent abatement in the demand and mills are operating at their fullest capacity to make deliveries on specifications. The demand for finished material continues heavy and already the agricultural implement manufacturers, whose orders are not expected before June or July, are making inquiries, and it is probable that some contracts will be placed earlier than usual owing to the fact that there are no indications of lower prices as was the case at this time last year. There was considerable buying of Bessemer iron during the week, one lot of 15,000 tons having been sold for delivery during April and May at $16.25 at the furnace. There have also been good sized sales for delivery during the second half of the year, at $15.75 at the furnace. The advance made on structural steel has stimulated buying and one of the largest contracts placed was received by the American Bridge Co. for the steel of the train shed of the new Union station under erection here. A meeting of the plate manufacturers will be held in New York on Thursday, but it is hardly probable that prices will be advanced. At present all the plate mills are quoting 1.50c for tank, although the pool price is only 1.40c. If the pool should

decide to advance prices to 1.50c, the action would be only formal. The amount of business closed by the National Tube Co. during the past month exceeds the tonnage of the greatest previous month by about one-third. The coke output of the Connellsville region continues to increase weekly and the scarcity of the product will result in the payment of much higher prices in the near future.

PIG IRON.—The sales of Bessemer iron the past week were reported quite heavy, a considerable tonnage having been placed for delivery during the second half of the year. We note the sale of 15,000 tons at $16.25 for delivery during April and May. Bessemer for extended delivery is selling at a somewhat lower price a large tonnage having been placed at $15.75. Forge iron continues scarce and we note the sales of 2,000 tons at $14.75, Pittsburg. We also note the sale of 1,000 tons at $14.50, Pittsburg. The sales of foundry iron the past week aggregate approximately 5,000 tons. No. 2 is held at $15.25, Pittsburg, while No. 1 is selling at $15.75. We revise quotations as follows:

Bessemer, Valley	$15.75 to 16.25
Bessemer, Pittsburg	16.50 to 17.00
No. 1 Foundry	15.50 to 15.75
No. 2 Foundry	15.00 to 15.25
No. 3 Foundry	14.50 to 14.75
Gray Forge, Pittsburg	14.50 to 14.75

STEEL.—Both Bessemer and open-hearth billets continue scarce and we note carload lot sales of the latter at $30 per ton at the mill. We also note the sale of 500 tons of Bessemer billets at $24.50, at the mill. It is practically impossible to secure any considerable tonnage of either of these products as all the mills in this district are practically sold up.

FERRO-MANGANESE.—Although the trade looks for an advance in ferro the largest producer continues to quote $62.50, for domestic, 80 per cent, delivered at buyer's mill.

RAILS AND TRACK MATERIAL.—The Carnegie Steel Co. has secured an order during the past week for 16,000 tons of steel rails from the Chilian government. The mill at Braddock is operating to its fullest capacity and new records for large tonnage were established at this mill this week. The demand for light rails continues strong. We make the following quotations: Rails, standard sections, 50 pounds and over, in lots of 200 tons and over, $26; car lots and less than 200 tons, $28; less than car lots, $30; light rails, 12 pounds, $34; 16 pounds, $32; 20 pounds, $31; 25 to 40 pounds, $28. Track material: Spikes, 1.95c to 2c; track bolts, square heads, 2.50c; hexagon heads 2.60c; fish plates, 1.60c to 1.70c.

SPELTER.—The price of spelter still rules low despite the efforts of the producers to bring about an advance. During the past week prime Western grades have ruled at about 3.88c, Pittsburg.

BARS.—Steel bars continue in active demand and mills are not making quotations for more than 60-day deliveries. The price of 1.50c is being maintained by all the manufacturers in this district for carload lots, while as high as 1.55c to 1.60c is secured for smaller orders. Iron bars are held at 1.55c to 1.60c, Pittsburg. Refined bars are held at 1.80c to 1.85c.

STRUCTURAL MATERIAL.—The advance on structural material has resulted in the placing of considerable business and as there is a large amount of building in progress in the largest cities of the country the structural steel manufacturers are looking for the placing of a very large tonnage during the present month. The American Bridge Co. has been awarded the contract for the erection of the train shed of the new Union station here. The contract calls for about 5,000 tons of material. We make the following quotations: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 6 inches, 1.60c; universal mill plates, 1.55c.

MUCK BARS.—We note the sale of 2,000 tons of muck bar for delivery during the next two months at $27.50, Pittsburg.

SKELP.—Iron skelp continues scarce and sheared and grooved is held at 1.85c to 1.95c. Steel skelp, both sheared and grooved is held at 1.75c to 1.80c.

PLATES.—A meeting of the plate manufacturers will be held in New York this week for the purpose of discussing the general situation. It is not at all probable that prices will be advanced although the pool price might be advanced to the ruling market price of 1.50c for tank plates. Plates for immediate delivery continue scarce and premiums of $1 per ton are being paid for delivery within 30 days. We make the following quotations: Tank plate, ¼-inch thick up to 100 inches in width, 1.50c at mill, Pittsburg; flange and boiler steel, 1.60c; marine, ordinary firebox, A. B. M. A. specifications, 1.70c; still bottom steel, 1.70c; locomotive firebox, not less than 2c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $1 extra; gauges Nos. 8 and 9, $2 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

PIPES AND TUBES.—So great is the demand for pipes and tubes that several of the idle mills of the National Tube Co. were placed in operation last week. The amount of tonnage placed with the leading producer last month was greater by about one-third than that of any previous month since the existence of the company. Discounts to consumers in carload lots, Pittsburg, are as follows:

MERCHANT PIPE.

	Carload lots. Black Per cent.	Carload lots. Galv. Per cent.	Less than carload lots Black Per cent.	Less than carload lots Galv. Per cent.
⅛ to ⅜ and 11 to 12 in	59.2	46.2	54.9	40.9
½ to 10 inches	66.7	53.3	61.9	49.9

BOILER TUBES.

	22 Feet and under. Per cent. Iron.	Steel.
1 to 1¾ and 2¼ to 5 inches, inclusive	43⅓	65⅓
2 to 2¼ inches, inclusive	43	60
6 inches and larger	53	59

CASING.

	S. and S., per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4½ to 12½ inches	65

O. D. PIPE.

	Per cent.
14 to 22 inches	42
24 inches, o. d. and larger	37

THREADS AND COUPLINGS.

	Per cent
14 to 16 inches o. d.	35

SHEETS.—Black sheets continue in big demand and the American Sheet Steel Co. has placed several idle mills in operation the past week owing to the great demand. Prices for black sheets remain unchanged while galvanized rule comparatively low on account of the low spelter market. Quotations in carload lots are as follows: Black sheets, one pass through cold rolls, No. 30, 3.65c; No. 29, 3.55c; No. 28, 3.35c; No. 27, 3.25c; Nos. 25-26, 3.15c; Nos. 22-24, 3.05c; Nos. 19-21, 2.95c; Nos. 17-18, 2.80c; Nos. 15-16, 2.70c; Nos. 13-14, 2.60c; Nos. 10-12, 2.50c. For more than carload lots a reduction of 5 cents per 100 pounds is made for less than carload lots an advance of 15 cents per 100 pounds over the above prices is asked. Galvanized sheets are strong at 70 and 5 to 70 off.

OLD MATERIAL.—During the past week the Carnegie Steel Co. has purchased a considerable tonnage of heavy melting stock. It is stated that the tonnage aggregates fully 5,000 tons. The price paid was $17.25 to $17.50, Pittsburg. The market generally is strong and we make the following quotations, gross tons: Heavy melting stock, $17.25 to $17.50; low phosphorus melting stock, $20 to $21; steel rails, $16.50 to $17; busheling scrap, $15 to $15.25; No. 1 wrought, $17 to $18; iron rails, $22 to $23; cast borings, $8.50 to $9; cast scrap, 14.25 to $14.50; relaying rails with joints, $23.

WIRE AND WIRE NAILS.—Jobbers in this district report a tremendous demand for wire nails and all kinds of wire products. The trade would not be surprised to hear of an advance at any time. Prices are unchanged as follows: Single carloads of wire nails to jobbers, $2.30 in Pittsburg; to retailers, $2.40. Plain wire, carload lots, is now quoted at $2.25 to jobbers and $2.35c to retailers; painted barb wire, $2.60c, in carload lots to jobbers, and $2.70 to retailers; galvanized barb wire, $2 in carload lots to jobbers, and $3 to retailers. Cut nails are quoted at $2, Pittsburg, in carload lots, 2 per cent off in 10 days.

MERCHANT STEEL.—The demand for all kinds of shafting is reported very strong although prices remain unchanged. All the mills of the largest tool steel producer are operating in full and demand is reported very strong. We make the following quotations: Turned, cold rolled and ground shafting at 55 per cent off for car lots and 50 per cent off for less than car lots; tire steel in carload lots and over, 1.65c; less than carload lots, 1.70c. Toe calk is held at 1.75c in large lots, and in small lots as high as 1.80c. Tool steel is held at 7c and upwards, according to quality; hoops and bands, 1.95c to 2c.

COKE.—The Connellsville region continues to break records with its weekly production and during the week ending March 23, the total estimated production of the district was 231,233 tons. In addition nearly 20,000 ovens were active an dthe idle ovens in the region are being lighted daily to meet the demands. The price of coke continues firm, although there is not sufficient large buying to force the price upwards at the present. Connellsville furnace coke is held at $2 per ton while outside coke is held at $1.85. Connellsville foundry coke is held at $2.50, while outside foundry is quoted $2.25.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
934 MONADNOCK BLOCK, April 2.

One large factor in the car axle trade reports his capacity sold up for the balance of the year. Rolling mills in general may not be quite so far sold ahead, some being filled only to October or November, and others only to July 1, but the average booked engagements project into the future some distance ahead of mid-summer, and this makes trading essentially so restrictive that it does not fully represent the actual conditions of the market. Makers have not only retired in many instances from the market, but they are getting more and more belated in making deliveries. But the usual concomitant of this condition, namely, a feverish state, seems wholly absent. Demand is not quite up to the proportions of a week ago: still less up to those of a month ago, and the buyer who fails to obtain the consideration desired makes no hue and outcry about it, as he did under similar conditions two years ago. Current business runs mainly to moderate sized lots and is divided between present and future needs. Quite a number of options that were out on structural shapes were hurriedly closed when the announcement of a rise in prices was made early last week, a goodly tonnage thus being booked. Generally speaking, there is enough pressure exerted by buyers to keep the natural tendencies upward.

PIG IRON.—There are reports of a possible advance in the freight rates on pig iron. The independence of the carriers is shown by their refusal to guarantee rates for as long a period as they have done in the past, and this attitude may be the foundation for the reports mentioned. No further changes in pig iron prices are observable this week but the temper is strong. Sales are week by week slowly receding from the high water mark of a month ago, but the volume is still in excess of production and the order books of the furnacemen are more heavily weighted than before. Furnacemen are so well sold ahead that comparatively little iron is procurable for near-by shipments. Transactions are for medium sized lots, running from, say, 1,000 tons down. Inquiries have been large for gray forge and stocks of that grade are pretty well cleaned up. Quotations follow:

Lake Sup. Charcoal	$18 00 to $19 00	Southern Coke No. 4	$14 40 to $14 65
Local Coke Fdy. No. 1	16 00 to 16 50	Southern No. 1 Soft	15 90 to 16 40
Local Coke Fdy. No. 2	15 50 to 16 00	Southern No. 2 Soft	15 40 to 15 90
Local Coke Fdy. No. 3	15 00 to 15 50	Southern Silveries	15 90 to 16 15
Local Scotch Fdy. No. 1	16 00 to 16 50	Jackson Co. Silveries	17 50 to 18 50
Local Scotch Fdy. No. 2	15 50 to 16 00	Ohio Strong Softeners	16 50 to 17 00
Local Scotch Fdy. No. 3	15 00 to 15 50	Alabama Car Wheel	21 00 to 22 00
Southern Coke No. 1	15 90 to 16 40	Malleable Bessemer	16 00 to 16 50
Southern Coke No. 2	15 40 to 15 90	Coke Bessemer	17 50 to 18 50
Southern Coke No. 3	14 90 to 15 40		

BARS.—Demand is not quite so brisk since the advance. There were large and important transactions for needs running well through the year, when iron and steel were around 1.50 to 1.55c, but the further rise has taken the edge off the demand. This may be well for the stability of prices, for the mills are so comfortably situated in the matter of well filled order books that they are not seeking additional business. Steel is stronger at 1.65c and iron is also higher at 1.60c, though that figure may possibly still be shaded by a few mills. The store trade in bars is particularly good, owing to the difficulty in obtaining prompt shipment from mill.

STRUCTURAL MATERIAL.—The past week has been more active in shapes. One of the local orders placed was that for the Chicago *Tribune* building, which will require about 2,700 tons, work upon the twelve-story structure to be commenced at once. Quite a number of other orders, mostly arising from options previously given, have been closed, though for the larger sizes of shapes reasonably prompt shipment may still be procured. Revised quotations are as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 1.75 to 1.80c; plates, 1.65c; tees, 1.80c; zees, 1.75c; small lots from store, ¼ to ½c higher.

PLATES.—An excellent inquiry for plates continues, the demand coming from all branches of the trade. For early shipment stocks are difficult to obtain. We quote as follows: Mill shipment, Chicago delivery, tank steel, 1.65c; flange steel, 1.75c; marine steel, 1.85c; fire-box steel, ordinary, 1.85c; fire-box, special, 2.25c and upwards.

BILLETS.—There is demand but no supply and the market remains nominally unchanged at about $26 for Bessemer.

RAILS AND TRACK SUPPLIES.—All sellers of rails in this market are experiencing in a moderate way a steady inquiry for rails, both standard and light sections. Many of the rails are wanted for early summer, but the mills are now so well sold up that little tonnage can be procured before fall. Quotations are as follows: Rails, standard sections, $26; light sections, $26 to $30; splice bars, 1.45c to 1.55c; spikes, 1.80c to 1.90c; track bolts, hexagon, nuts, 2.65c to 2.75c; square nuts, 2.45c to 2.55c.

SHEETS.—For both black and galvanized sheets the call is persistent. Especially is the demand good for the latter. Building operations will soon be in progress and a large tonnage of galvanized is needed. Mills are overcrowded with orders and shipments are backward. No. 27 black is quoted at 3.40c from mill and galvanized is held at 70, 5 and 2½ per cent Chicago.

MERCHANT STEEL.—There is no let-up in the needs of consuming manufacturers, who are steady inquirers, sometimes getting what they want, often catching only promises to be treated in the best manner possible consistent with the heavy duty imposed upon the mills. Prices mill shipment are very firm, as follows, Chicago delivery: Smooth-finished tire steel, 1.90c to 1.95c; open-hearth spring steel, 2.50c to 2.75c; toe calk, 2.40c to 2.55c; sleigh shoe, 1.80c to 1.90c; cutter shoe, 2.40c to 2.55c; ordinary tool steel, 6c to 7c; specials, 13c and upwards. Cold rolled shafting, 55 per cent discount.

MERCHANT PIPE.—Among the smaller makers there is a disposition to withhold quotations, pending the advance which rumor says is soon to be made, but no indications of a change of prices has yet appeared otherwise. Business has now reached the full tide of spring and both from mill and store product is moving rapidly. Random lengths are quoted as follows, Chicago delivery:

MERCHANT PIPE.

	In carloads		Less than carloads.	
	Blk.	Galvd.	Blk.	Galvd.
⅛ to ½ inch and 11 to 12 inches	59.2	46.2	54.9	40.9
¼ to 10 inches	66.7	53.3	61.9	49.9

WIRE AND WIRE NAILS.—March shows up with a tonnage about equal to the phenomenal trade of February, and April from the preliminary inquiries at hand promises almost equally well. The demand includes all branches of the wire industry. Prices are unchanged, namely: Single carloads of wire nails to jobbers, $2.40; Chicago, to retailers, $2.50; plain wire, carloads, to jobbers, $2.35; to retailers, $2.45; painted barb wire, to jobbers, carloads, $2.70; to retailers, $2.80; galvanized barb wire, carloads, to jobbers, $3; to retailers, $3.10.

OLD MATERIAL.—Railroads are securing somewhat better prices for their scrap, bids, which a short time ago would secure the orders, no longer meeting with favorable response from the prospective seller. It is not known that there is absolute scarcity, save in melting scrap, but the market acts much that way. Prices continue to tend upward. Dealers' selling prices per gross ton are as follows:

Old iron rails	$19 50 to $20 50	Old wheels	16 50 to 17 00
Old steel rails, long	15 00 to 19 00	Heavy melting steel	14 00 to 14 50
Old steel rails, mixed	14 00 to 15 00	Mixed country steel	10 00 to 10 50
Relaying rails	20 00 to 22 00		

The following are selling prices per net ton:

No. 1 R. R. wrought	15 50 to 16 50	Iron axles	18 00 to 19 00
No. 2 R. R. Wrought	14 00 to 15 00	Cast borings	4 00 to 4 50
Dealer's forge	12 50 to 13 00	Wrought turnings	8 50 to 9 00
No. 1 busheling	9 75 to 10 00	Iron axle turnings	9 00 to 9 50
Heavy cast	12 50 to 13 00	Steel axle turnings	8 00 to 8 50
Railway malleable	11 50 to 12 00	Stove plates	7 50 to 8 00
Country malleable	10 00 to 10 50	Old iron splice bars	16 50 to 17 00

CLEVELAND.

OFFICE OF *The Iron Trade Review*
1064 ROSE BUILDING, April 3.

Another week has passed without the shaping up of the ore situation. Several of the leaders in ore councils have been for some time at the real center of power in the iron trade

and a meeting is not expected until their return. The United States Steel Corporation, while yet a considerable seller of Mesabi ores is also still a buyer of old range ores. It will naturally be a very considerable factor in establishing the price for 1901. Another question that is not fullly determined relates to the ownership of Lake Superior mines by the Morgan consolidation. It may be a larger owner of old-range mines when the season opens than it is today. In the past week, as announced elsewhere in this issue, it has acquired the Oliver one-sixth interest in the Oliver Iron Mining Co. and the Pittsburg Steamship Co. The Aragon mine, under option some time ago to the Oliver Iron Mining Co., is as good as transferred, though the sale was not consummated when the press announcement of the past week was made. The price is understood to have been $2,500,000, not $2,000,000 as reported. The proposal for the acquisition of the ore, vessel and furnace interests of the Cleveland-Cliffs Iron Co. which has been under consideration for some time is said to be on a basis that would mean $9,500,000 for all the properties. This would represent 190 for the stock which has been quoted lately at 135. There is no official confirmation of the rumors concerning this company, but it is known that the question of sale has had some consideration. The Corrigan, McKinney & Co. mines, an important group of non-Bessemer old-range properties, with an especially good representative of the Mesabi range, are reported to be under option, together with the allied vessel and furnace interests, to the Pittsburg capitalists who are promoting the consolidation of Valley furnaces. Several furnaces are mentioned whose owners are unwilling to sell out to such a syndicate and conflicting opinions are given by persons in interest, as to the probability of such a project being put through.

There has been some speculation and figuring on the ore and vessel handling arrangements such a Valley furnace combine would make. Of larger interest is the problem of concentrated management of the vessels of the United States Steel Corporation, there being now five managing and clerical forces for these vessels. Various Cleveland interests are competing for this prodigious contract. The freight situation is still under cover. The engineers' strike does not necessarily put an embargo upon ore traffic, some of the engineers not being members of the union. Some of the latter, it is understood, are averse to a clash and some shippers speak with hope of their ability to man their vessels fully when they are ready to start out. The probability of a late opening is already being discussed, some of the vessel men advocating concerted action to that end.

PIG IRON.—There is a steady demand for steel-making and foundry irons. Gray forge is also active at firm figures, $14 in the Valley having been paid, though $13.75 can be done. The sales of Bessemer have been for May and June delivery, and $16.25 to $16.50 at furnace is still the basis, the latter being for delivery in the next month. On later deliveries lower prices are made, $15.75 at Valley furnace being reported for delivery beyond July 1. The near future will show a slight increase in Bessemer production, due to the change from foundry by one or two furnaces. There is still some irregularity on foundry iron. While $14 for No. 2 is the lowest price that can be heard of among sellers, while some of them are asking $14.25 and as high as $14.50 at furnace, an occasional delivered price is reported that indicates that some one has taken business netting less than $14 at furnace. Buyers find it difficult to locate such sellers, however, and when it becomes known that the iron is a comparatively new brand, are not willing for the concession to leave their accustomed brands. While the blast furnace consolidation in the Valleys is under consideration, with assurances of success, so far as a majority of the furnaces are concerned, there is a report of plans for a new blast furnace of modern size and construction, in the city of Cleveland. The building of coke ovens in connection with it is also discussed. We quote the Cleveland market as follows:

Bessemer	$16 50 to 17 25	Valley Scotch No. 1	$15 25 to $15 75
No. 1 Strong F'dry	15 25 to 15 75	Valley Scotch No. 2	14 75 to 15 00
No. 2 Strong F'dry	14 75 to 15 00	Gray forge valley	13 75 to 14 00
No. 3 Foundry	14 25 to 14 50	Lake Superior charc'l	17 50 to 18 00

FINISHED MATERIAL.—Mail orders continue to be of good volume, and mills are filling up to a later and later point in the year. Indication of the large consumption is found in the orders for starting up mills in the Valleys that have been idle for over a year in some cases—particularly bar, sheet, and skelp mills. There are rather better deliveries of plates from some mills, but others, particularly the larger ones, are sold until late in the year. We quote 1.50c for tank, and as high as 1.60c has been paid to secure deliveries. The advance in structural material was anticipated by some buyers; others came into the market quickly on the announcement in the hope of getting the old price. The result has been two weeks of large business. In the past week about 4,000 tons has been closed for bridge and architectural purposes in Cleveland. The remarkable activity in trolley line extensions still keeps up, and in the week a total of 3,800 tons of rails has been closed or figured on locally for this work. Bar mills are running to full capacity, and there is an excellent outlook for further business. We quote iron bars at 1.50c at Valley mill and steel at 1.45c to 1.50c, Pittsburg mill. The sheet market is very strong at the prices last quoted: No. 27, one pass through cold rolls, 3.20c to 3.25c, No. 28, 3.30c to 3.35c. On the heavier gauges we quote blue annealed sheets as follows: No. 12, 2.10c to 2.15c; No. 14, 2.20c to 2.25c; No. 17, 2.40c; No. 18, 2.50c to 2.60c. For one pass through cold rolls these gauges are $5 to $7 a ton higher.

OLD MATERIAL.—We quote the market substantially as at last report, prices being strong on the following basis, all for gross tons: Old iron rails, $19 to $20; old steel rails, 6 feet and over, $16 to $16.50; under 6 feet, $15; iron axles, $22 to $23; No. 1 railroad wrought, $15.50 to $16.50; wrought turnings, $9.50; wrought borings, $9 to $9.50; cast borings, $5.50 to $6; old car wheels, $17; No. 1 machinery cast scrap, $14 to $15; mill scrap, $15; grate bars, $8 to $9; stove plate, $10.

CINCINNATI.

April 2.

Matthew Addy & Co. write as follows: "The week has opened with heavy inquiries in all directions. These inquiries are for all kinds of iron with foundry brands in the greatest demand. March was in every way a satisfactory month. It witnessed continuous heavy buying and April bids fair to follow its record. It also was a month of heavy shipments. The furnaces were urged by consumers to ship iron in many cases faster than contract specifications. As a result, there will be a decided change in the statistical showing of stocks on hand. These stocks will be shown to have been greatly reduced. This month promises to just about wipe out furnace stocks except the little lots that necessarily remain on hand. And the iron has not simply been transferred from the furnace to consumers' yards. It has been actually used, for in every branch of work there is the most intense activity. From what our customers tell us they feel tolerably well assured that 1901 will be one of the greatest years in the iron and steel trades that the country has known.

"The particular feature of current sales is the large proportion of iron being sold for shipment over the last half of the year. The Ohio furnaces have sold large quantities of malleable iron for this delivery. Northern foundry iron for nearby shipment is now practically out of the market. Such was the tonnage of new business last week for Northern iron (Ohio foundry and malleable) that prices advanced 50c per ton. The accumulation of gray forge in the South of which so much was said in January is now a matter of the past. It has all been sold. In the first place, this accumulation was largely a myth; that is, there was never on hand the quantity reported by those who did not know but who were interested in bearing the market. Gray forge iron now promises to be as scarce as the other grades of Southern pig. As we said before, the whole tendency of the market is still decidedly upward."

Rogers, Brown & Co.'s weekly review has the following: "The continued heavy buying of pig iron has occasioned considerable surprise, but many of the recent orders have been for extended delivery. When the buying movement started in February, there were but few who had enough confidence in the market to purchase beyond the first half, but the evidences of increasing strength have been so convincing, that a general desire is shown to cover requirements during the third and even the fourth quarters of the year. In Southern foundry iron, prices have been marked up 25c per ton; but as usual,

there are a number of producers willing to make sales at 25c. per ton below, and there is a difference of about 50c per ton between the highest and lowest sellers. In the central territory heavy sales of malleable iron have been made. There has been quite a heavy demand for Ohio high silicon brands, and prices have advanced 50c per ton. Lake Superior ore foundry irons are relatively the cheapest brands now in the market in this district. It is supposed, however, that there will be more firmness in that direction as soon as a few of the most anxious sellers are supplied with orders."

We quote for cash f. o. b. cars Cincinnati: Southern coke, No. 1 foundry, $14.75 to $15; No. 2, $14.25 to $14.50; No. 3, $13.75 to $14; No. 4, $13.25 to $13.50; gray forge, $13 to $13.25; No. 1 soft, $14.75 to $15; No. 2 soft, $14.25 to $14.50; Lake Superior coke, No. 1, $15.50 to $15.75; No. 2, $14.75 to $15; Hanging Rock charcoal, No. 1, $20 to $21; Jackson Co. silvery, No. 1, $16 to $16.50; Standard Southern car wheel, $18.25 to $18.75; Lake Superior charcoal, $18.50 to $19.50.

PHILADELPHIA.

April 2.

A slight improvement continues from week to week in the pig iron trade, there being but little expected in the way of advances until the ore question, at least, is settled. The manufacturers of pig iron recognize that while foundry and mill irons are not bringing prices in proportion to other products it will not be difficult to secure a marked advance as the season's business develops and the situation clearly warrants such a course. Stocks are decreasing with every week.

PIG IRON. There has been a general disposition to hold out for an advance of 25 cents over last week's prices, but so far the responses have not been characterized with any great alacrity. The following prices will represent the average quotations for Philadelphia and immediate vicinity: No. 1 X foundry, $16.00 to $16.25; No. 2 X foundry, $15.00 to $15.75; No. 2 plain, $14.50 to $15.00; standard gray forge, $14.25 to $14.50; ordinary gray forge, $13.75 to $14.00; basic (chilled) $14.50 to $14.75; standard Bessemer, $15.00 to $15.25 at furnace.

BILLETS. Consumers are not as urgent in their requests for immediate delivery, the majority having covered their requirements for a short time ahead. Ordinary soft steel can be had at $26.20, though considerable business in high carbon steel has been done at from $28 to $30.

FINISHED MATERIAL. This is the strongest end of the market, makers of plates and sheets finding it no trouble to secure any reasonable figures for April and May delivery. The majority of mills are so full of orders, however, that but few are able to accept new business for immediate wants. An advance of ten cents per hundred pounds is being paid for plates, while angles, beams and sheets have gone still further, in many cases obtaining an advance as high as twenty cents per hundred. Bars are unchanged, but the Eastern Bar Iron Association, which will hold a meeting this week, may arrange a new schedule and also bring about an agreement as to prices. Current quotations are as follows for seaboard and nearby deliveries: Plates one-quarter inch and thicker, 1.70 to 1.75c.; bar iron, 1.40 to 1.50c.; steel bars, 1.60 to 1.65c.; angles, 1.75 to 1.85c.; beams and channels, 1.75 to 1.85c.

OLD MATERIAL. The visible supply of old material is limited and continues to command full prices. Bids and offers are about as follows for deliveries in buyer's yards: Choice railroad scrap, $19.00 to $20.00; No. 1 yard scrap, $14.00 to $15.00; No. 2 light scrap, $12.00 to $12.50; machinery cast, $14.50 to $15.00; heavy steel scrap, $16.25 to $16.50; old iron rails, $19.50; old steel rails, $16.25 to $16.75; wrought turnings, $11.75 to $12.50; cast borings, $8.00 to $8.50; old car wheels, $17.50 to $18.00; old iron axles, $22.00 to $23.00.

BIRMINGHAM, ALA.

April 1.

The local iron and steel market presented no new features last week, but the inquiries continue good with heavy sales at the advanced price. Pig iron is now quoted here as follows: No. 1 foundry and No. 1 soft, $12.25; No. 2 foundry and No. 2 soft, $11.75; No. 3 foundry, $11.25; No. 4 foundry and gray forge, $10.75. President Baxter of the Tennessee Coal, Iron & Railroad Co. states that the market is in a satisfactory condition and President Hopkins of the Sloss-Sheffield Steel & Iron Co. adds that indications favor continued good business. Several sales of from 2,000 to 5,000 tons each were made in the past week for delivery during the summer and early fall.

The Sloss-Sheffield Steel & Iron Co. started up its Lady Ensley furnace at Sheffield March 30, and the first run of iron will be made today. The Hattie Ensley furnace at the same place will be ready to go in blast the latter part of this month.

The Republic Iron & Steel Co. will have its third furnace at Thomas, three miles from Birmingham, completed and ready to go in operation by June 1.

The rail mill of the Tennessee company at Ensley will be completed by June 1 and will be put in operation immediately thereafter.

Officials in Birmingham of the companies interested say there is no foundation for the rumor that the Tennessee Coal, Iron & Railroad Co., the Sloss-Sheffield Steel & Iron Co. and the Republic Iron & Steel Co. will consolidate. The rumor that the Federal Steel Co. had acquired an interest in the Tennessee company is also denied.

Adler Bros. of this city have acquired an interest in the Tutwiler Coal, Coke & Iron Co. and the capital stock of the company has been increased from $50,000 to $1,000,000. E. M. Tutwiler continues as president and Edgar Adler goes in as general manager.

New Armor Plate Hardening Process.

At the plant of the Carbon Steel Co. in Pittsburg there was completed last week an armor plate six feet long, five feet wide and six inches thick, manufactured by the method recently invented by S. A. Cosgrave of Pittsburg, whose many years of experience in the steel business in Pittsburg lends special import to the invention. The face hardening method which constitutes Mr. Cosgrave's invention is a secret and will not be made public until after the tests of the plate have been made by the United States government. It is claimed, however, that the process is much cheaper than either the Harvey or Krupp process and that much better results can be obtained, but the accuracy of this latter statement can only be ascertained after experts have completed their tests. The basis of the plate is simply open-hearth steel without either nickel alloy or chemical ingredient. It is claimed that the plate can be face hardened to any desired depth. The test plate weighs 18,000 tons.

Republic Iron & Steel Co.

Activity in the stock of this company in the past week has given rise to the reports that it would be included in a consolidation with two important Southern interests, also that the United States Steel Corporation was negotiating a purchase of the company. The preferred stock went as high as 81½ on Tuesday of this week, and the presence of officers of the company in New York lent color to the stories current. It can be stated on authority that at the present time there is no deal for absorption by the Morgan company. The Southern story referred to by our Birmingham, Ala., correspondent, is also incorrect. There is this much basis of truth in statements connecting the Tennessee company with the Republic Iron & Steel Co. The latter has a valuable property in the Thomas furnace, ore and coal lands, mines and coke ovens. These and the remaining plants of the company, which are all in the West and Central West, are widely separated. Supervision and inspection of the Southern properties is not easy. It is not unlikely that the leading Southern producer and the Republic Iron & Steel Co. could agree on a basis upon which the former would purchase the Southern blast furnaces and other Alabama property of the Republic company. It is understood negotiations are now under way.

The Union Trust Co. Building of Cincinnati, a modern structure recently finished in that city, contains the offices of agencies of several well known steel companies. W. H. D. Totten, Jr., sales agent for the Carnegie Steel Co., has removed from the Neave Bldg. to 1016-17 Union Trust Bldg.; J. L. Adams & Co., sales agents for the Cambria Steel Co., also from the Neave Bldg. to rooms 1622-23 Union Trust Bldg. George Kinsey, manager of the Jones & Laughlins agency, has removed from the Grand Hotel Bldg. to 1209 Union Trust Bldg.

THE IRON TRADE REVIEW

Devoted to Machinery, Metal-Working and Foundry Trades and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE IRON AND STEEL PRESS CO.,

ROSE BUILDING, CLEVELAND, OHIO.

G. H. GARDNER, President and Treasurer.
JOHN A. PENTON, Vice-President.
A. I. FINDLEY, Secretary.

A. I. FINDLEY, EDITOR.

CHICAGO: 934 Monadnock Block, GEO. H. GRIFFITHS, Manager.
DETROIT: Hammond Building.
PHILADELPHIA: 908 Rothschild Building, WM. D. THOMAS, Manager.
PITTSBURG: 429 Park Building, A. O. BACKERT, Manager.
NEW YORK: 150 Nassau St., D. C. WARREN, Eastern Manager.

Subscription, $3 per annum. To Foreign Countries, $4.00. Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

APRIL 4, 1901.

ANNOUNCEMENT.

D. C. Warren has been appointed Eastern representative of *The Iron Trade Review,* with office at 150 Nassau St., New York. The business of the paper, both in subscriptions and advertising in this important territory, has been increasing in a way that calls for the undivided service of one thoroughly familiar with the field and the wants of our constituency. Mr. Warren is such a man.

A change has been made also in the Chicago and Western office of the paper. Mr. Geo. H. Griffiths, who has had a varied experience on both the editorial and business sides of trade journal work, has been made Western manager, entering upon his work April 1. His office is 934 Monadnock Block, Chicago.

THE NEW POWER IN THE STEEL WORLD.

When the consolidation fever was raging in the iron trade in the early months of 1899, some concern was expressed lest the entrance of men representing large financial interests into places of control in the new corporations, would result in a hurtful subordination of technical and practical men. But the men who had been most successful in the conduct of individual enterprises found that their services were still much in demand and at large salaries. Indeed, it has been demonstrated that the new conditions have called for the highest order of talent. There has not been a suppression of competition, but a vast increase in the size and strength of the competitive elements, and in their power for doing harm when trade is ruled by the spirit of war.

Perhaps with more reason than in 1899, the question will now be asked, in scanning the directory of the United States Steel Corporation, "Where are the steel men?" To be sure they are represented, but only six of the 24 are men who had to do directly with works management in iron and steel, previous to the consolidation period of 1899. It is a forcible showing of the rapidity of the evolution in steel manufacture, that out of hundreds of men who were at the head of important plants but two years ago, only so small a number appear now in the directory of the company that is destined to become the Standard Oil Co. of the iron trade.

It will be said, no doubt, that the duties of these directors of the new corporation will pertain largely to the financial side of its life, and that they represent the owners of the capital which stands for the bulk of the property involved. And this is the fact. The iron and steel plants of the country have indeed passed into the hands of new owners. The king of industries has attracted the strongest aggregation of industrial capital in the world. And this ownership by others than steel manufacturers, practical men and technical men, will be emphasized later as the securities of the new company work down the line into the hands of the investing public.

Much has been published from Wall Street sources in the past week or two of the probable earnings of the new corporation. The presence of so many prominent Standard Oil Co. officials is pointed to as a prophecy of the application of Standard Oil Co methods to the iron trade. The prediction has been made that the common stock will sell ultimately higher than the preferred, and the company's securities are already gazetted as the popular investment and speculative stocks of the future. It is true that Mr. Rockefeller has entered sooner into the steel trade, and through the front door, than many in the trade believed would be the case. Newspaper space in plenty has been devoted in the past five years to outlines of his plans for great blast furnaces and steel works representing the most modern construction and practice—and generally the story had some touches referring to an impending battle royal with the leading Pittsburg company. The reality is different from the picture, but it is significant that the house of Rockefeller comes into the steel trade as some other well-known names disappear, and that hereafter the names that stand for millions will be the synonyms for the iron and steel development of the United States Whether they will keep all the promises of those who are now most industriously touting the new stock is another question. One would naturally expect from such control a policy that would put the new securities among the soundest on the list, making the declaration of dividends on stocks representing good will and the overflow of prosperous times entirely a secondary consideration.

Perhaps the most noteworthy feature of the launching of the new corporation, particularly of the last few weeks in which its plans have become better known, has been the comparative absence of vindictive criticism. There is nothing like the railing and opposition that were seen on every hand two years ago, as the industrial consolidations came into being one after another. How is the change to be accounted for? Is there a more general belief that the trust is a necessary evolution and must be endured, for good or for evil. Or is the liberality of men of millions begetting a more complacent feeling toward large aggregations of capital? Or, yet again, is the public verdict upon the Morgan consolidation in suspense? Certainly no industrial organization in the world's history has been so full of possibilities affecting the social

and economic status. It holds the key to the future of our industrial system.

Crucible Steel Company to Build Blast Furnaces.

At a meeting of the directors of the Crucible Steel Co. of America held at Pittsburg this week it was decided to organize the St. Clair Furnace Co., for the erection of two large blast furnaces with a daily capacity of 600 tons each. These furnaces will make the Crucible Steel Co. absolutely independent of the pig iron market and will take a large tonnage from the furnaces in the Mahoning and Shenango Valleys, which in the past furnished the company with pig iron. The furnaces are to be erected this summer. The open-hearth steel plant to be erected by the company will have a daily capacity of 1,200 tons of steel and the new furnaces will be ample for all the necessities of the new plant.

At this meeting, Reuben Miller, treasurer of the company, was elected chairman of the executive committee to succeed William G. Park, whose resignation was accepted about ten days ago. Next Tuesday the directors will fill two vacancies on the executive committee occasioned by the resignation of William G. Park and Vice-President James W. Brown.

1,995 Tons from Two Converters in Twelve Hours.

The night turn in the converting department of the Edgar Thomson Steel Works of the Carnegie Steel Co. at Braddock, Pa., established a new steel making record from Sunday evening, March 31, until Monday morning, April 1. During a period of 12 hours two converters turned out 1,995 tons of Bessemer steel in 133 heats. There are three converters in this department, but one is constantly out for relining. Each heat averaged 15 tons and the average time for blowing the heat from the time of pouring into the converters until the ladles were filled with steel preparatory to casting the ingots was less than 11 minutes. The best previous record made in this department was 1,800 tons of steel in 120 heats. The ingots so produced were rolled into rails for the B. & O. railroad, the sections being 75 pounds to the yard. During the same turn in the rail department 3,195 rails were produced.

Wellman-Seaver Cranes for Shipyard Use.

The Fore River Ship & Engine Co., of Quincy, Mass., which is building one of the largest shipyards in this country, and has lately taken contracts for two battleships for the U. S. Navy, has contracted with the Wellman-Seaver Engineering Co., of Cleveland, for a crane service over their shipbuilding berths. This construction will be of steel throughout and will consist of a steel framework, which will carry two pairs of runways over each ship, on which will be operated small electric cranes of about 5-tons capacity, so that instead of one cantilever gantry serving two ships while under construction, as is the case in most ship yards, each berth will have two cranes for use during the whole time of the construction of the ship. These cranes will be designed for a very high speed, so that the work of putting the materials in place during the building of the ship can be performed with the greatest possible saving of time. The Wellman-Seaver Engineering Co. has also contracted with the above company for a fitting-out crane of an entirely novel design. This will be an electric traveling gantry wharf crane, with a folding jib, so that the crane can be moved to its place alongside of a ship, the jib lowered to its place, and the machinery or other material taken out of, or put into the ship as may be desired. This crane has two trollers, one of 50 tons capacity and one of 25 tons. There is also a lifting tackle of 10 tons capacity attached to the end of the jib, which may be used for putting masts or smoke stacks into the ship. It is believed that this crane will prove to be a very useful tool for a shipbuilding plant.

Jones & Laughlins, Ltd., have taken the contract for furnishing 1,100 tons of structural steel for the new Keystone Bank Bldg., Pittsburg.

John Davis, president of the John Davis Co., 75 Michigan St., Chicago, manufacturers and dealers in steamfitting supplies, died at his home, 4850 Woodlawn Ave., Chicago, Sunday morning, after an illness of several weeks. Deceased was born in Barre, Vt., July 4, 1834, and organized the company of which he was president in 1864.

President Sheffer of the Amalgamated Association of Iron, Steel and Tin Workers of America is sanguine over the prospects of organizing the Eastern independent mills of the country. He claims to have assurances that the mills can be organized provided some method of arbitration will be inaugurated which will prevent strikes in the future. Mr. Shaffer has been ill for some time and is just able to be about.

The Harbison-Walker Co. of Pittsburg has purchased 5,000 acres of fire-clay land in Carter county, Kentucky, and will build a silica brick plant there in the very near future. This plant will enable the company to deliver its brick in the South at a much lower price than at present.

S. B. Y. McVay, formerly superintendent of the Brown Bonnell plant of the Republic Iron & Steel Co. at Youngstown, O., has been appointed general manager of the recently acquired plant of the American Rolling Mill Co. of Chicago, located at Muskegon, Mich.

The puddlers in the employ of the Glasgow Iron Co. at Pottstown, Pa., have been notified that beginning with April 6 they will receive an advance in wages of 25 cents a ton. The 112-inch plate mill of the company which has been idle for some time resumed operations this week.

H. S. Vrooman, of Chicago, dealer in fire brick, formerly located at 220 W. 20th St., has removed his office to the corner of W. 18th Place and Sangamon St.

The Pittsburg Steel Foundry has removed its main offices from the German National Bank Bldg. to 304 and 305 Bank of Commerce Bldg., corner of 6th and Wood streets, Pittsburg.

It is significant that, although steel makers on the English Northwest Coast are threatened with American competition, in all specifications given out by builders for ship plates and other building material, none but English or Scotch plates and shapes are acceptable.

An English exchange says: Messrs. W. Jessop & Sons of Sheffield announce that they intend for the future to manufacture certain qualities of steel in the United States to supply their customers in that country. The principal reason given at the meeting this week for this step was the heavy duties of from £10 to £13 a ton which are charged on steel imported into the United States. These charges cause British steel to be so dear in America as to be almost prohibitive except to a comparatively small number of users. Their action is one part of a movement which is by no means new. The great Sheffield firm of Firth's are making steel in America, and Seebohm and Dieckstahl are erecting plant there. Several Sheffield firms, including Messrs. Charles Cammell & Co., are also establishing works in Russia for the manufacture of various Sheffield staple goods there in order to avoid the duties.

Pickands, Mather & Co., of Cleveland, have sent out a leaflet giving exhaustive analyses of their iron ores for the season of 1900, together with the guarantees on iron and phosphorus that are made for 1901. The ores are classified under the headings, old range Bessemer ores, Mesabi Bessemer ores, old range non-Bessemer, Mesabi non-Bessemer, silicious and manganiferous. The same firm has mailed to its customers recently copies of charts prepared by R. G. Beker, of Cleveland, showing in graphic form the pig iron and iron ore production of the United States and other countries in the past 30 years and at intervals in the early part of the last century.

At the Lochiel mills of the Harrisburg Rolling Mill Co., Harrisburg, Pa., notices were posted this week that the wages of the puddlers would be advanced 25 cents a ton on April 16 and on the same day the men in the other departments of the plant will receive similar advances.

UNITED STATES STEEL CORPORATION.

The development of the week in connection with the new United States Steel Corporation is the announcement that the American Bridge Co. has been taken over as originally intended. Important also is the increase of capital stock from $850,000,000 to $1,100,000,000, which with $304,000,000 bonds makes the total $1,404,000,000. The extension of time for depositing steel stocks with J. P. Morgan & Co. expired on Saturday, and on Monday, April 1, it was given out from the office of the company that practically all the stockholders in the constituent companies had turned over their holdings to the combine. On account of the absence in Europe of a few scattered stockholders the exchange would not represent all the outstanding stock, but pledges from some of these insured a practically unanimous acceptance of the terms offered. Speculation in the stocks was active on Wall Street on Monday, the total sales amounting to 434,900 shares, 266,100 common and 168,800 preferred. The prices held up well, the closing being at 47⅞ for the common and 96¾ for the preferred. On Tuesday the common reached 49 and the preferred 97½.

Officers Announced.

Charles J. Steele of J. P. Morgan & Co. gave out a statement on Monday to the effect that the election of directors of the new company would take place in a day or two. The statement is as follows:

"In accordance with their circular of March 2, 1901, which provided among other things that the entire plan of organization and management should be determined by J. P. Morgan & Co., they now announce that the management and organization of the United States Steel Corporation will be constituted as follows: Directors, J. Pierpont Morgan, John D. Rockefeller, Francis H. Peabody, Henry H. Rogers, Charles M. Schwab, Elbert H. Gary, Robert Bacon, Charles Steele, Marshall Field, Norman B. Ream, P. A. B. Widener, William H. Moore, James H. Reed, Henry C. Frick, Daniel G. Reid, E. C. Converse, Percival Roberts, John D. Rockefeller, Jr., Alfred Clifford, William E. Dodge, Nathaniel Thayer, William Edenborn, Abram S. Hewitt and Clement A. Griscom.

"President, Charles M. Schwab; treasurer, Arthur F. Luke; secretary, Richard Trimble; executive committee, E. H. Gary, chairman; Daniel G. Reid, William Edenborn, E. C. Converse, Percival Roberts and Charles Steele; finance committee, Robert Bacon, chairman; Henry H. Rogers, Norman B. Ream and P. A. B. Widener."

American Bridge Co. Included.

A circular addressed by J. P. Morgan & Co. to the stockholders of the American Bridge Co. and the Lake Superior Consolidated Iron Mines announces that the offer of the syndicate made on March 2, 1901, has been accepted by more than 98 per cent of the holders of stock and the plan proposed has become operative. Morgan & Co. offered for the account of the United States Steel Corporation in exchange for the preferred and common stock of the American Bridge Co. and for the stock of the Lake Superior Consolidated Iron Mines certificates for preferred and common stock of the United States Steel Corporation upon the following basis:

"For each $100, par value, of preferred stock of the American Bridge Co., $110, par value, in the preferred stock of the United States Steel Corporation. For each $100, par value, of common stock of the American Bridge Co., $105 in the common stock of the United States Steel Corporation. For each $100, par value, of stock of the Lake Superior Consolidated Iron Mines $135, par value, in the common stock of the United States Steel Corporation."

The circular further says: "Arrangements have already been made for the acquisition upon the above basis of more than 85 per cent of the stock of the Lake Superior Consolidated Iron Mines, embracing the interests of John D. Rockefeller. Arrangements have also been made for the acquisition by the United States Steel Corporation of all the outstanding interest in the Oliver Iron Mining Co. and the Pittsburg Steamship Co., not owned by the Carnegie Company. The offer herein made for the stock of the American Bridge Co. is conditional upon the deposit and sale hereunder of at least two-thirds in amount of all outstanding shares of the capital stock of said company, which two-thirds shall include two-thirds of the outstanding perferred stock.

Stock Increases to $1,100,000,000.

"The authorized capital stock of the United States Steel Corporation has been increased to $550,000,000 of preferred stock and $550,000,000 of common stock. The corporation has appropriated and has agreed to issue $425,000,000 of such preferred stock and $425,000,000 of such common stock under the contract referred to in the circular of March 2, 1901, and it proposes to issue the remainder of such authorized capital stock for future acquirements and acquisitions including the acquisition of the stocks deposited under this circular.

"Deposits of Lake Superior Consolidated Iron Mines stock must be made at our office in New York. Deposits of preferred and common stock of the American Bridge Co. may be made either at our office in New York, or at the office of Kidder, Peabody & Co., Boston. All deposits must be made on or before the 15th day of April, 1901. After that date no deposit will be received except in our discretion and on such terms as we may prescribe."

The increase of the United States Steel Corporation stock to $1,100,000,000 was made by an amendment to the charter filed with the Secretary of State at Trenton, N. J., April 1. The state's fee for the filing of the papers was $220,000. The original articles were only amended in one particular. This amendment was made to take advantage of an act passed by the recent legislature. Originally the corporation could not mortgage or pledge its real property or any of the stock of any other company except by the affirmative vote of the owners of two-thirds of the capital stock. Under the amended charter it is necessary to have only the affirmative vote of two-thirds of the stock represented in person or by proxy at any meeting of the corporation. The reason for the change is the fear that the stock will become so scattered that it would be impossible to get two-thirds of the entire stock represented at a meeting.

Large Contract for Smelting Machinery.

Fraser & Chalmers, of Chicago, have taken a contract from the Compania Metalurgica de Torreon, in Mexico, for the equipment of an extensive plant for the treatment of silver-lead ores. Its capacity will be 800 tons per day. Torreon is at the junction of the Mexican International and Mexican Central railways, which reach rich mineral country. The smelting plant will comprise four large water jacketed blast furnaces and four large reverberatory roasting furnaces, three rotary pressure blowers, sampling and sulphide ore mills complete with fore-hearths, slag trucks, coke and ore cars and all equipment for operation.

Water supply is no small consideration in so extensive a plant. It will be provided by the use of three large steam pumps, one of 50,000 gallons, one of 300,000 gallons, and one of 1,000,000 gallons capacity. There will be a steel water tower 75 feet in height, supporting a tank with a capacity of 50,000 gallons. Two 25-ton Porter locomotives will be used for conveying train-loads of material, and there will be full provision for electric lighting in the works, electric generators to be driven by a compound automatic engine of 100-h. p. The steam power requirement will be heavy. Two Fraser & Chalmers cross-compound Corliss engines of 500-h. p. each will suppply this power, and steam will be furnished by six boilers of 200-h. p. each, with Morrison suspended furnaces. A machine shop and blacksmith shop will be included in the essential equipment of these works. A considerable town will be built up about the nucleus furnished by the great furnaces and powerful machinery of Fraser & Chalmers, of which the foregoing is a summary. The weight of smelting machinery proper is about 1,500,000 lbs., and of all the machinery enumerated about 2,500,000 lbs.

The blast furnace workers at Sharpsville, Pa., were granted an advance of 10 cents a day on Tuesday, April 2, to take effect at once.

The Forter-Miller Engineering Co. of Pittsburg has been awarded the contract for twelve 50-ton open-hearth furnaces and five soaking pits by the Crucible Steel Co. of America.

BLAST FURNACE AND STEEL WORKS CHEMISTRY.

Silicon Determinations Where Speed Is Not Required.

To the Editor:—The practice at the laboratory of the Dunbar Furnace Co., on silicon determinations is as follows: Our usual time for a determination of silicon is 35 minutes, as no attempt is made to "speed" them. We usually run three silicons in about 50 minutes and could just as easily run six determinations in an hour. Particular attention is paid to four points: 1. Solution of sample before going to dryness; 2, thorough boiling after "taking up;" 3, careful washing of the filtered residue, and 4, being careful to "burn off" all graphitic carbon. Here is where the time is lost; but I consider it "time well used." We use hot acid for "taking up;" filter with suction, and ignite on blast lamp. We could run the silicons faster, if necessary; but in our case it is not, as the analysis has simply to be gotten out in time to load the metal from the cast house, and silicon, sulphur and phosphorus determinations are run at the same time.

When you "speed" a silicon determination past a certain limit, accuracy is sacrificed for time, though for approximate results as a guide it often becomes necessary to do so. Our silicons have a wide range, varying from .50 (basic iron) to 2.50 (foundry iron), and in the latter case it is easy to see that a longer time is necessary to burn them off properly.

STUART B. MARSHALL.

Dunbar, Pa., March 25.

Accuracy First, Then Speed.

To the Editor:—It has never been the aim of my work to see how quickly I could get certain determinations made, but to get them done well. The first thing I try to impress upon those in my employ is to get careful and accurate work out, and the next element is rapidity and I only want that so far as is consistent with good work. I know there is a limit beyond which these part company. We can make a careful and accurate sulphur and silicon determination for the furnace in a half hour from the time we get drillings. Until about one year ago we were making on the average of 100 silicons per day. This was the work of two men from 8 until 5.

J. C. BARRETT.

Ohio Works, National Steel Co.,
Youngstown, O., March 26.

For Pig Iron Silicon, 25 to 30 Minutes.

To the Editor:—In reply to your request: My experience has been that a single determination of silicon can be made in 25 or 30 minutes, and if a number of determinations are carried on at the same time, in a proportionately longer time. This applies to pig irons. In the case of steels, where there is no graphite to be gotten rid of, the time can be shortened several minutes.

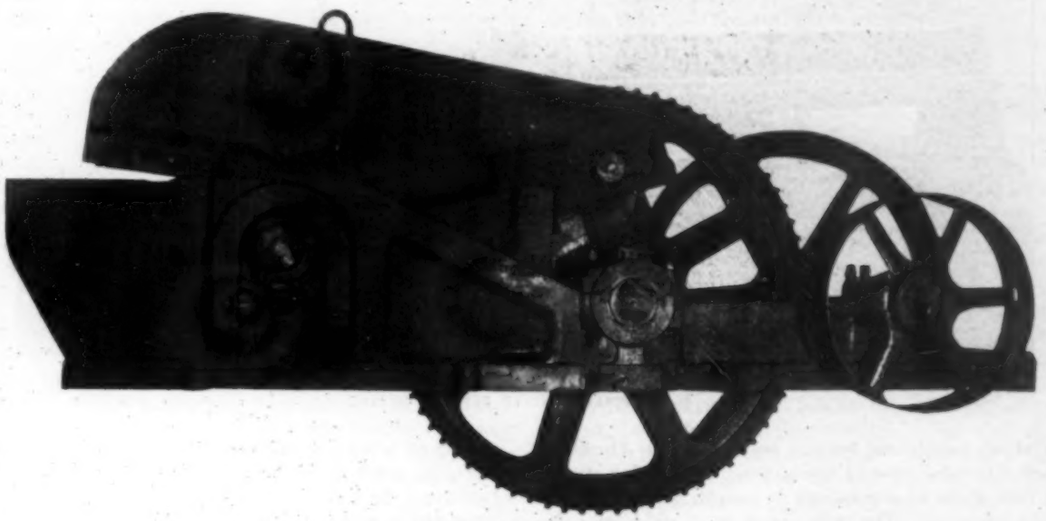
G. M. GOODSPEED,
McKeesport Works, National Steel Co.

McKeesport, Pa., March 26, 1901.

A 120,000-POUND SHEAR.

Thomas Carlin's Sons Co. of Allegheny, Pa., have just completed one of the heaviest shears ever built, for the Kane-Maloney Iron & Steel Co. of Pittsburg. The shear is of the right hand lever type and complete weighs 120,000 pounds. While the makers only claim for it a capacity for cutting 6x6 inch billets, billets 6x8 inches have been successfully cut by the shear set up in the foundry. The bed plate of this immense shear weighs 56,000 pounds while the lever weighs 30,000 pounds. The gear wheel weighs about four tons, and the lever pin, which is of hammered steel, and 10 inches in diameter, 2,280 pounds. Other parts are proportionately heavy.

The shear is pitman driven with the gearing inside of the bed. The gear wheel is 106 inches in diameter, with a 12-inch face and 4½-inch pitch. The shear can be geared up to a speed of from 18 to 24 cuts per minute. The knives are 32 inches long with four cutting edges. The fly wheel is 8 feet in diameter. In setting up the shear there is required a floor space 21 feet long and 9 feet 8 inches wide. Two shears of the same size and type are now being built at this plant.



A 120,000 POUND SHEAR.

Steam Hammer Foundations.

In connection with the matter of machinery foundations and vibrations resulting from their insufficiency, there comes to mind the apt remark made by someone concerning a certain steam hammer that it seemed to him much like an earthquake on stilts. Steam hammer foundations have, indeed, proved difficult things to deal with in many instances, owing to the particularly trying conditions involved in the operation of such a piece of apparatus. In erecting the 125-ton steam hammer of the Bethlehem Steel Company a number of years ago—the largest hammer in the world, by the way—a foundation about 60 feet square was prepared, and piles were closely driven over the whole area. The piles were covered over with timbers 34 inches square, and on top of these were put steel beams about 35 feet long, and each weighing something like 40 tons. On top of these there was more cross-timbering, and then the anvil block was put on, weighing about 1500 tons. After running the hammer for a short time the foundation went down 8 or 10 inches, and, unfortunately, did not go level, which made matters worse. Mr. John Fritz, under whose supervision the work was done, in speaking of it some time ago, said that he thereupon took out everything down to the piles, levelled the foundation up again, and put in a 2-foot thickness of wood shavings. A lot of men were put on to tramp that down to about 16 or 18 inches; the heavy timbers were then placed on the shavings; next came the steel beams, placed crosswise, and on top of these 10-inch square timbers. After these came about fifteen hundredweight of cast iron, covered with 3-inch plank and 12 inches of cork. On top of the cork there were, again, 10 inches of timber, and then finally came the anvil block. The elastic shavings bed was intended to absorb the heavy blow on the foundation, and subsequent experience showed that it admirably accomplished its purpose.—[Cassier's Magazine.

ELECTRICALLY DRIVEN BENDING ROLLS.

The Niles Tool Works Co., of Hamilton, O., and the Bullock Electric Mfg. Co., of Cincinnati, are jointly producers of the combination shown in the accompanying illustration—bending rolls driven by an electric motor. The rolls are solid wrought iron forgings arranged in pyramid form, and have a capacity for bending plates up to 12 in. in width and 5/8-in. thick. The lower rolls are geared together while the upper or bending roll is revolved by the friction of the plate in passing through. It is adjustable by power to suit the thickness of the plate and the radius to which it is to be bent. It has a hinged bearing at one end, which may be turned down out of the way, while the other end has a long shank extending to a third support which retains the roll in position for the removal of rings or flues. This will be found an advantage in boiler and other shops where plates are to be bent to a complete circle.

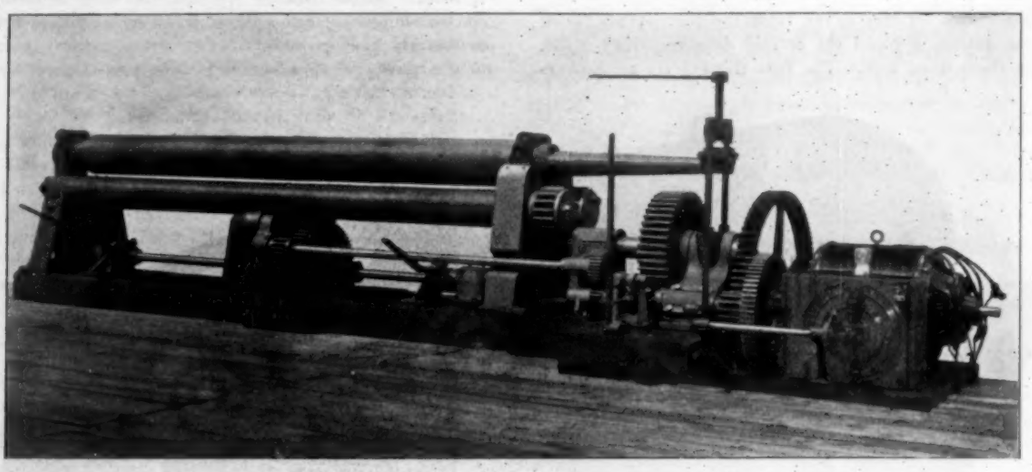
Midway between the housings a set of supporting rollers is placed to give additional stiffness to the lower rolls. For very long machines additional sets of rollers are added. The machine is firmly tied together by a heavy cast iron sole plate. It is very strongly geared and all parts are made stiff and substantial. Suitable levers and clutches are placed for the quick and easy control of all the operations.

The machine is driven by an 18 h. p. reversible, constant-speed Bullock motor. For controlling the motor, an automatic rheostat is used to prevent the operator from throwing on the full current too quickly and burning out the motor. The field consists of a circular yoke of special steel. Particular attention has been given to a reduction in weight, but not at the sacrifice of efficiency. The pole pieces, built up from soft sheet steel of the highest magnetic quality, are securely bolted to the yoke. The shape of the punchings is such as to produce a saturated pole face, and this feature, added to carefully proportioned windings, is largely responsible for the sparkless operation of the motor.

The field coils are machine wound and carefully insulated. The shunt and series coils of compound wound machines are separately wound. The coils are slipped over the pole before it is bolted to the yoke, and should it be necessary are readily removed. The armature core is built up from thin, carefully annealed sheet steel, possessing a high magnetic permeability These discs are again annealed and then japanned. They are mounted upon the shaft and held firmly together by malleable iron end plates.

The windings, which are let into slots provided in the periphery of the armature core, are made of either copper bars or wire as best suits the requirements. The coils are machine formed, and after being formed are thoroughly insulated with mica and other high grade insulations. They are then baked in steam heated forms while under pressure, which removes all moisture. The resulting coil requires no further insulation when placed in position on the core. The coils of armatures are held in position by wedges of hard, well-dried wood, driven into notches provided near the top of the slots.

The commutators are built from drop forged bars of pure lake copper with selected mica insulation. The brush holder is of the reaction type. No adjustment of the brushes is necessary, and when they are once set the motor will operate in either direction without sparking and under all variations of load.



ELECTRICALLY DRIVEN BENDING ROLLS.

Heavy Cars Shortening the Life of Light Cars.

Car building companies are receiving heavy orders for new cars to replace light capacity cars that have been practically used up by the system of running the old style light car in the same train with larger capacity cars. The *Financial Chronicle* speaks of this subject as follows:

"The railroads are finding that a new and an urgent problem is being forced upon them in the use of the heavy type of locomotive and the larger capacity cars which have come into such a widespread use of late. Few railroads are able to employ the new heavy equipment in full trains, and the running of trains composed of the old style light weight cars, even those of 60,000 pounds capacity, in the same train with 80,000 pound and 100,000 pound cars, has resulted in enormous damage to the lighter cars. The time these light cars are in profitable service has become considerably diminished by the frequent necessity of sending them to the shops for heavy repairs required by the damage done to them through the unequal strains in mixed train service. This loss of the service of cars, in the present period of enormous tonnage movement, when few railroads, even with the large additions to rolling stock which have been made in the last three or four years, have more than the equipment which can be used in profitable service, means a considerable loss. In addition, there is the direct cost, which frequently appeals to managers more forcibly than a loss in revenue, of the largely increased expenses for repairs to these freight cars. This problem of the heavily increased cost of repairs has become so important that it promises to subordinate other topics of discussion in the mechanical development of the railroads. One eminent authority has stated that fully 70 per cent of the freight cars in the railroads in the United States now out of service and awaiting repairs consists of cars whose coupling and draught rigging appliances have been insufficient to sustain the pulling, blows and other strains they have received by being operated in mixed trains."

The committee on standardizing bureau of the American Foundrymen's Association announces that a second lot of sample A has been prepared, the first lot having been exhausted. They may be obtained by addressing Thos. D. West at Sharpsville, Pa. The association's drillings are now used in 200 laboratories in this country and abroad.

The Ellwood plant of the American Tin Plate Co., located at Ellwood City, Pa., resumed operations last week after an idleness of nine months.

AMERICAN ENGINEERING AS A WORLD FACTOR.

American Engineering Competition; Being a Series of Articles Resulting from an Investigation Made by *The Times*, London. New York and London, Harper & Bros. 12mo., 139 pages. Price $1.

The London *Times* articles which are gathered together in this book attracted no little attention and comment in the spring and summer of 1900. The gist of them is given in the publishers' announcement of the reprint, which refers to them as "authoritative articles which describe with remarkable clearness how completely American manufacturing and engineering enterprises are taking the lead over all the nations of the earth—especially over Great Britain." That a journal like the *Times* should be so willing to admit American engineering superiority was not welcome to leaders in British engineering and metallurgical operations. Some of them had made admissions in their society meetings that were tantamount to this, but they related only to specific details and phases of practice. The sweeping character of the *Times* correspondent's statements was what drew the fire of Sir Lawthian Bell and other authorities in the iron industry.

We have before us the *Times* editorial announcing the series of articles now published in book form. The following extract from it will show the purpose of the inquiry, as well as the unsparing frankness of the *Times* in holding up before British captains of industry their conspicuous shortcomings: "The size of the factories, the completeness of their plant, the immense extension of labour-saving appliances, the consequent superiority of workmen compelled everywhere to use their brains instead of trusting to monotonous repetition of simple manual efforts, the flexibility of ideas among employers and their eagerness to abandon the good at any moment, and at any cost, for the sake of the better—all these things must be seen to be thoroughly understood. We trust, however, that these articles may at least open the eyes of some people at home to the fact that there is a great deal which it behooves them to understand, and may stimulate them to look for themselves into the very grave problems which lie before English manufacturers, even in those departments where their supremacy was once most undisputed. It is not in war alone that the people of this country cling to the comfortable belief that we shall 'muddle through somehow.' On the contrary, the phrase is as thoroughly characteristic of the mental attitude of the Briton as is 'tomorrow' of that of the Spaniard. As a nation we really believe in muddling through, and are rather proud of ourselves for believing. There is a deep-seated feeling that it is un-English to attempt anything more, and that our dignity requires us to eschew that eagerness in organizing our forces and utilizing our opportunities which other nations do not blush to display. As a matter of fact, this feeling is not nearly so respectable as we fondly imagine. It is the product of intellectual laziness and false pride. Muddling is a thing to be ashamed of, and a thing which proper pride makes a man ashamed of, however successful he may be in its despite. But, even if muddling through were the noblest form of human effort and the only one worthy of a gentleman, the fact remains that it is becoming every day more unsuited to the actual condition of the world. We are not winning any great triumphs by muddling through, and with every decade that passes our triumphs will become more difficult to discover, unless we condescend to bring scientific method to bear upon our conduct of public and private affairs."

The name of the writer of the articles is nowhere given. It cannot be unknown to the managers of American works he visited, but the *Times* has kept his identity a secret. The first impression one gets from the book is that the writer enters with enthusiasm on the task of praising American progress, particularly in iron and steel. Some of his judgments are of the sweeping character one might expect from an observation tour that left little time for detail. But he only pretends to write broadly; and thus some of his statements woven into sketchy and graphic narrative, lack the analytic property that some of his engineering critics felt they had a right to expect. For example, describing blast furnace operations at Duquesne the author says: "The working of a blast furnace never stops. Year after year, from the time it is first lit, or 'blown in,' there passes down its fire-brick throat this constant stream of ore, coke and flux—a thousand tons a day. The red-hot breath from the blowing engine rushes upwards and meets the molten stream without ceasing, until at last the mighty digestion is worn out, after gorging perhaps a million tons, and the furnace is blown down for a new lining." Of course this was written for popular consumption.

American blast furnace practice is favorably commented upon, but this judgment is qualified with a question whether the American policy of hard driving is economical. The author appears here to be tinctured with the notion common to British blast furnacemen that the life of a lining and the number of tons produced in that time are the sole standards of economical operation. The chapters on "The Heavy Iron and Steel Trade," "Steel Works," "Ore Supplies and Transports," "Manufacture of Steel," and "Structural Steel Work," are appreciative descriptions of operations and equipment at the fittest plants in the country. Summing up the marvelous exhibits of mechanical development found in these works the author gives the key to American achievement in these words: "From the humblest kitchen to the mammoth factory—from peeling apples or washing plates to heaping tons of coke and ore into the blast furnace—the American always strives to do what he can by machinery; and the inevitable consequences are that labor is better paid and that there is more demand for it than in any other country." In the chapter on structural steel four sentences are typical of the author's appreciation of the American method in cheapening product and then making a market for it: "When we find one firm building for themselves a railway bridge across a river as wide as the Thames at London simply to make communication between two of its factories, it is easy to suppose that bridges are not very expensive in America." . . . "The energy with which Americans make business is remarkable. Steelmakers manufacture markets out of nothing. If an architect says he cannot put steel in place of wood, the steelmaker employs an expert to show it can be done. This is how the Carnegie staff of designers of steel buildings was called into existence."

The chapters on "Locomotives," "Stationary Engines" and "Machine Tools" cover ground that has been written upon extensively on both sides of the water in the technical and daily press. The writer refers to the debt the American machine tool maker owes the British builder, but is free to say that there are many features about American machine tools that indicate independent thought. "In some of the machine shops of the United States," he says, "the effort for accuracy is carried to an extent that would seem almost a craze were it not justified by events." . .. . "In the present day highly expensive machine tools of extreme exactitude are the foundation of much of the successful and cheap engineering work of both America and of Great Britain. Costly as such appliances are, they contribute far less to the debit side of the ledger than the skilled labor they displace." The Pratt & Whitney and the Brown & Sharpe plants are referred to with some detail as typical of the New England advance, and in heavy machine tools the works of the Niles Tool Works Co. at Hamilton, O.

The chapter on "Malleable Castings and Agricultural Implements" was reproduced in full in our issue of July 5, 1900, so that reference to it here may be omitted. "The manufacture of malleable castings," the author says, "is one of the branches of engineering production in which the Americans have been very successful and to which British engineers might with advantage closer attention." "Transit and communication" and "The Labor Question," to which two chapters are devoted, complete the book. The conclusion reached from the description the author gives of labor conditions in England is that as long as union rule prevails there as it does today it will not be possible for British engineering concerns to compete with those in the United States.

The demands of the structural iron workers of Pittsburg for an advance from 33 1-3 cents an hour to 40 cents an hour to become effective May 1 has been granted by the American Bridge Co. On January 1 the men were granted an advance in wages from 27½ cents an hour to 33 1-3 cents an hour.

The American Car & Foundry Co. is said to have under construction 30,000 cars representing total cost to railroads of $25,000,000.

MACHINE SHOP HEATING AND VENTILATING.

In the April number of the *Engineering Magazine* Leicester Allen has an article on "The Economy of Heating and Ventilating the Machine Shop." We make some extracts below:

As to the desirability of good ventilation in large factories, I might urge altruistic motives; but more and more the control of such establishments is falling into the hands of large incorporated companies, popularly called trusts, and I fear that altruism can hardly be put down as one of the moral assets of such capitalistic combinations. A more hopeful argument seems to be the very opposite motive, self-interest. It requires but little thought to reach the conclusion that, in a building containing a thousand human working units, a very small per cent of increase of individual efficiency would amply pay for a considerable aggregate expenditure. To get the best return for wage expenditure is the problem which every good manager of a factory has to solve. But the best can be obtained only under essentially favorable conditions. For example, I once was engaged in a crowded drawing office in executing some fine diagrams representing graphically the behavior of gases, under various pressures and temperatures to which they would be subjected during a cycle process. No special provision existed for the ventilation of this room, which was heated by pipe coils placed under the windows. Those obliged to work near the windows could not tolerate having them opened on account of vicious drafts which swept in from the surface of an adjacent ice-covered river. In that room I was frequently attacked by blurred vision. A single line appeared as two, vibrating or undulating throughout their entire extent each into the other, making futile any attempts at accuracy until, by a walk in the open air of twenty minutes to half an hour, the disturbance of vision was removed. No doubt the work in that ill-ventilated den cost 10 per cent more than it would have done in a comfortable well-ventilated office. The wages paid there must have been at least $50 to the entire force each day, and if by reason of decreased efficiency one-tenth of the possible service was not rendered, the employers lost $5 a day during the cold season, which might have been saved if attention had been given to proper heating and ventilation. * * * *

It appears very strange to me that the subject of factory ventilation has received so little attention, while the collateral subject of factory heating has been carefully studied. Most of the ventilating appliances, where the nature of the operations carried out are such as to compel some sort of ventilation, are miserably inadequate, and it is only in recent years that forced mechanical ventilation has been adopted even in manufactures where deleterious or even poisonous gases or dust are evolved from the materials operated upon.

The overhead system of heating by steam-pipes ranged and suspended near the ceiling, where revolving shafts, pulleys and belting keep the air in motion, is a convenient way of heating a workroom and relieving the floor space from heating apparatus; but such ranges of heating pipes accumulate dust, and their position is unfavorable to a good system of ventilation. The extent to which overhead heating has been adopted in itself indicates the small importance in which factory ventilation has been held hitherto. Now, when it is remembered that rooms in most factories usually occupy entire floors—say 50 feet wide and from 100 to 300 feet long, while their height is not more than from 16 to 20 feet—it will be seen that a very different set of conditions exist in factory ventilation from those presented in a church, school, or theater. To attempt the removal of impure air from an outlet at one or both ends, or from the ends and the middle, of the room would entail the suction of all the bad air toward these points of egress, so that while in some parts the air might be unobjectionable, in the parts near the outlets impure air would be massed. The only correct way of ventilating such a room, in my opinion, is by numerous outlets uniformly arranged around the walls, and equally numerous inlets for pure air, and the securing of constant and uniform circulation by mechanical means. In designing a new building this would add very little, if anything, to the cost of erection. With engines of the non-condensing type supplying motive power, the exhaust steam can be used for heating and generally this supply would be ample. The current cost for ventilation would, in such a case, become the interest and deterioration on the cost of installation and the cost of the power necessary to run the blower.

Though, as above intimated, figures are not at hand to indicate the improvement either in output or quality of work in well-ventilated work-rooms, as compared with rooms or factories ill-ventilated, or not at all ventilated, I shall fail in the main purpose of this article if I cannot make a successful appeal to common sense to sustain my view of the case. Would not the cost of such ventilation as indicated in the preceding paragraph be more than repaid in the increased pecuniary return realized in quality and quantity of work? This is the question which must be answered definitely and affirmatively before any general adoption of ventilation as a regular specialized feature of factory plants can be expected. The history of the world's industries affords no encouragement that working conditions will be spontaneously and vitally improved by the mass of employers, unless the latter can see profit in the change.

There is encouragement to be gathered in the effect upon special industries which have been derived from other improvements. It is within my memory and experience that, in a large manufacturing town, a new factory providing itself with nice washing facilities, toilet and wardrobe accommodations, and an elegantly kept lawn and flower garden under the advice of one of the broadest minded and most intelligent mill managers it has ever been my fortune to meet, did, by the liberal expenditure thus advised, become able to get the pick and cream of some ten thousand mill operatives in the town, with, as the superintendent personally assured me several years afterward, advantage that much more than justified the expenditure.

If there is profit in considering the personal cleanliness, convenience, and taste of factory workers, why, in the name of common sense, should there not be profit in considering their health? If ventilation is profitable for a horse-stable why should not a factory be systematically and thoroughly ventilated?

I have met with the following line of argument against the practicability of the proposition:

"In the effort to make factory ventilation popular with proprietors, there will be raised objections the same as, or analogous to, those made by railway managers to car ventilation. Good railway-car ventilation is conceded to be an impracticable scheme. The space to be ventilated is too small in proportion to the number of occupants to admit of a sufficiently rapid change of air without injurious and very annoying draughts. The heat that it is practicable to supply is inadequate to heating fresh cold air in quantity sufficient for good ventilation; and, worst of all, the people differ so in their desires for heat that you can not suit them all in this particular. Some sit in their wraps and overcoats while others remove them. The only way in which to compromise is to disregard the wants of passengers. Do the best you can conveniently, and let the people continue to grumble. They will travel, all the same, ventilation or no ventilation. So the factory workers will be glad to get work, ventilation or no ventilation."

This argument, when thoroughly analyzed, is fallacious. If good ventilation would pay, the railways would supply it even if it required a single car for a single passenger. Passengers will not pay, as a rule, for good ventilation. A very large proportion of people occupy but a small proportion of their time in railway traveling, and prefer its temporary discomforts and risk its injury to health rather than pay the high fares which good ventilation and comfortable heating would demand. Passengers are not paid for services rendered to railway companies while riding in cars. If they were, the companies would strive to get the most for their money, by getting fullest service.

In hospital wards all in the same ward are served alike in the matter of heat and ventilation. If any wish to wear wraps or overcoats, and then complain of too much heat, they would be required to remove their coverings. Hospital administration is accompanied by discipline. So is factory administration. Railway companies cannot exclude cranks. In this respect a factory has the advantage over even a hospital. As to the difficulties of ventilation in factories, none exist that do not exist in hospitals, and, except in very rare instances where deleterious materials are handled and contaminate the

air, one-fourth—or even less—of the amount of fresh air for good hospital ventilation would more than suffice.

The main question is, "Will it pay?" I am not alone in believing that it would. Good service—the best of its kind in any sort of mental or manual work—is compatible only with entire relief from other demands upon the vital forces. I do not believe a first-rate editorial can be written by a man whose head aches, or that a painter could paint an immortal picture standing at his easel with rheumatic pain in his knees. But even these uncomfortable pains would be less potent in obstructing high attainments than the languor, lassitude, and want of interest begotten by long confinement in the foul air of an oppressively heated and ill-ventilated room.

We are at the beginning of the twentieth century and the most conspicuous tendency of human activity is to get a maximum result by a minimum of expenditure. Minimum cost of fuel, of transportation, of brain and muscle, must hereafter be considered in the mighty competition that characterizes the commerce of the world. Maximum results include both quality and quantity. To get both of these the conditions must be, even to the smallest, compatible with most successful achievement. Ventilation in factories is one of these necessary conditions. It will repay its cost as well as any other investment in the fitting up of a well-designed factory.

PERSONAL.

Archibald P. Head, of London, one of the managing directors of the Otis Steel Co., Ltd., of Cleveland, has an elaborate article with illustrations, in the London *Coal and Iron Trades Review* for March 15, describing the plant of the Alabama Steel & Shipbuilding Co. at Birmingham, Ala. An article on this plant appeared in *The Iron Trade Review* of Aug. 23, 1900.

Wm. Garrett, of the Garrett-Cromwell Engineering Co., Cleveland, sails for Europe this month. He will read a paper before the May meeting of the Iron and Steel Institute on "American and British Rolling Mill Practice."

B. D. Cameron, of Homestead, Pa., has been appointed superintendent of the open-hearth furnaces of the Sharon Steel Co. John Moody, now in the employ of the National Steel Co., will have charge of the blooming mill at the Sharon steel works.

E. R. Davis has been appointed superintendent of the American Steel Hoop Co.'s plant at Duncansville, Pa.

O. Owens of the American Steel & Wire Co. has sailed for Europe in the interests of that corporation. His headquarters will be in London.

H. C. Frick continues to buy business property in Pittsburg, his latest purchase being of a site upon which a cathedral is located. The price was $1,250,000.

John Lentz, manager of the lap weld department of the Pennsylvania tube works of the National Tube Co. at Pittsburg, Pa., was presented with a silver service by the employes of his department last week. Mr. Lentz has resigned to accept a position with the new tube plant which is to be erected at Zanesville, O.

John Baxter, general superintendent of the Continental Tube Works of the National Tube Co. at Pittsburg, Pa., has resigned to accept the superintendency of a tube mill under erection at Steubenville, O. He was handsomely remembered by the employes of the plant.

L. H. Bowman, armor plate designer for the Carnegie Steel Co. at Homestead, Pa., left for Russia last week to prepare designs for the armor for the Russian warships.

K. Yonekra, mechanical engineer of Japan, was in Pittsburg last week for the purpose of purchasing mining locomotives and machinery.

Mr. S. J. Robinson, managing director of W. Jessop & Sons, Ltd., crucible steel manufacturers of Sheffield, Eng., arrived in New York last week for the purpose of determining upon a location for the American plant to be erected by his company. Regarding the intentions of the company Mr. Robinson said: "We are going to build a plant on this side, principally with a view to escape the tariff of some $50 a ton which the United States government imposes on crucible steel. Having works here will enable us to extend our important business connections in America. We will make a feature of steel specialties which the Dingley tariff precludes us from manufacturing in England and shipping here. Another reason for our present step is that we now labor under a distinct disadvantage on the other side owing to the high price of fuel. On last year's business we had to declare a reduced dividend on that score, notwithstanding our books having shown the largest business in the history of the company. Our new plant will be in the vicinity of Pittsburg."

A. L. Schultz, formerly president and general manager of the Schultz Bridge & Iron Co., Pittsburg, Pa., has been appointed to take charge of the operating department of the American Bridge Co., covering the Pittsburg district, comprising the Keystone, Pittsburg, Schultz and Shiffler plants at Pittsburg; the Wrought Iron plant at Canton, O.; the New Columbus plant at Columbus, O., and the Youngstown Bridge Co. plant at Youngstown, O.

B. A. Kaiser, formerly chief engineer at the Edgar Thomson Steel Works of the Carnegie Steel Co., and later doing expert work for the same company, has become president of the Cuyahoga Iron & Steel Co. This concern is now erecting a rod mill at Cuyahoga Falls, O.

R. G. Wood, vice-president of the American Sheet Steel Co. and head of the W. Dewees Wood plant at McKeesport, Pa., tendered his resignation to the executive committee of the company this week and will retire from active participation in the affairs of the company. Allan D. Wood, his son, has also resigned his position and will retire as soon as a successor can be appointed to fill his position. Percifer F. Smith, who has been at the head of the Wellsville, O., plant of the company, was immediately appointed to fill Mr. Wood's place at the head of the McKeesport plant, but no successor as vice-president has yet been named. It is hardly probable that any meetings will be held for that purpose until after the reorganization takes place which follows the absorption of the company by the United States Steel Corporation.

Milton Coombs, who has been general superintendent of the upper and lower mills of the American Steel Hoop Co. at Youngstown, O., has been appointed assistant general superintendent of all the properties of the American Steel Hoop Co. Mr. Coombs will be assistant to Mr. Walter Jenks, who some time ago was appointed to the position of general superintendent, a position created when General Manager Frank Clark was called to New York to become one of the executive heads. Perry Edwards has been appointed to succeed Mr. Cooombs as superintendent of the upper and lower mills.

The Pittsburg Seamless Bottle Co. has awarded contracts to Wm. B. Scaife & Sons of Pittsburg to design, manufacture and erect the buildings for its new glass factory at Everson, Pa. Among the larger structures are the main factory building, mixing rooms, Lehr building, boiler and engine houses. Steel frame construction is to be used throughout.

The furnace operators of the Mahoning Valley have agreed to the advance in wages asked for by the blast furnace workmen. The men under the new wage scale will receive 20 cents more a day than they have been receiving and 10 cents a day more than they received before the cut in wages about the first of the year. Now that the workmen in the Mahoning valley have been advanced the blast furnacemen in the Shenango valley are asking for similar advances to be made no later than April 5.

The American Bridge Co. has secured through its Schultz branch of Pittsburg the contract for a large government warehouse at Progrese, Yucatan.

Official announcement was made last week by August Belmont & Co., of New York that the transfer books of the Westinghouse Electric & Mfg. Co. will close April 20 to allow the stockholders to subscribe for one share of additional stock at $55 for each five shares of existing stock. The present additional issue is $3,000,000 of the $10,000,000 authorized February 20. A syndicate has underwritten the entire amount. Subscriptions must be made by April 20, at the office of August Belmont & Co., accompanied by payment of $25 a share. The remainder of $30 is payable June 15, at which date the stock will be delivered. The new shares will be entitled to participate in all dividends declared after May 15. Failure to pay the final installment of the subscription price will forfeit all rights in respect of the stocks subscribed for and of the installment previously paid.

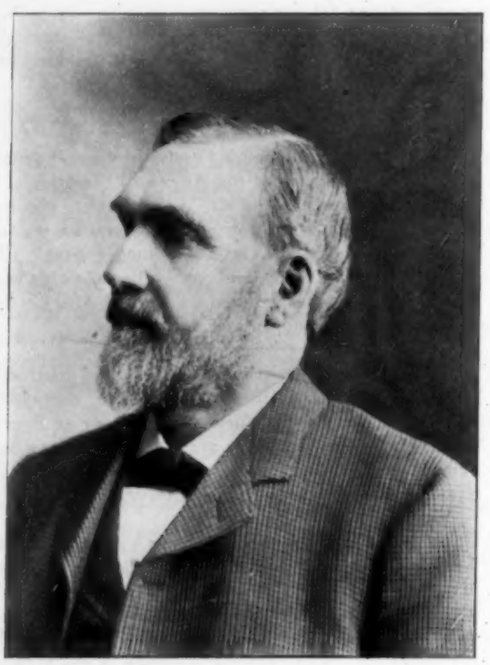
EDWIN REYNOLDS.

One of the Country's Foremost Engineers.

Mention was made in our issue of last week of the way in which the employes of the Edward P. Allis Co.'s works at Milwaukee, Wis., made noteworthy the 70th birthday of Edwin Reynolds, second vice-president and general manager of the company. We are glad to present this week Mr. Reynolds' portrait together with a sketch of his career. To him belongs the distinction of focusing upon a city in the Northwest remote from most centers of iron and steel production, the thought of steel manufacturers in connection with blowing engine development.

Mr. Reynolds was born in Mansfield, Conn., on March 23, 1831. His early education was that of the New England public schools. He was apprenticed at 16 to the machinist's trade, and after three years started the rounds of Eastern machine-making towns. In 1858 took up his residence in Aurora, Ind., as superintendent of the shops of Stedman & Co., engaged in the building of steam engines, sawmills, and drainage pumps for Mississippi plantations. The outbreak of the Rebellion interrupted this business, and he returned to his native state. Later he was engaged at his trade in New York and Boston.

At this time his judgment on engineering subjects became recognized and he was constantly employed as a mechanical expert in perfecting all manner of machines and mechanical devices. In 1867 Mr. Reynolds entered the employ of the Cor-



liss Steam Engine Co. of Providence, R. I., and in 1871 he became general superintendent, a position which he retained until 1877, when he associated himself with the late Edward P. Allis in Milwaukee, and began the development of his own inventions. During his connection with the Corliss company the old type of Corliss mill engine was brought to its highest degree of perfection. When he went to Milwaukee to develop the Reynolds-Corliss engine, he resigned the highest position in the organization of the then greatest engine building company in the country. The development and introduction of the "Reynolds-Corliss" engine was so pronounced a success from the outset, that Mr. Allis was shortly led to propose the arrangement which has resulted in Mr. Reynolds remaining permanently identified with the Allis company. The personal relations of these men were most harmonious, and on the death of Mr. Allis, Mr. Reynolds became, through his will, one of the trustees of his estate. When later the business was reorganized and the Edward P. Allis Co. was formed, Mr. Reynolds entered his present position as second vice-president.

Mr. Reynolds designed and manufactured a blowing engine for the old Joliet Steel Company which caused an upheaval among the engineering experts. The late H. S. Smith, who was then president of the steel company, had competitive designs submitted by experts both in this and in foreign countries. Mr. Reynolds was in the contest, and submitted a design which was a radical departure from current practice but so manifestly worked out on sound engineering principles, and so clearly an advance over the methods previously in use, that Mr. Smith awarded him the contract. Before the engine had been in use a month, Andrew Carnegie saw that its effect was revolutionary, and he gave an order for one like it. This led to upwards of $5,000,000 worth of business from the same company. Twenty years of effort have failed to improve on this design; its features remain unchanged and today it is the accepted type of blowing engine.

A very similar case was Mr. Reynolds' steam ore stamp. Here again his rigid adherence to fundamental engineering principles, in spite of the united opposition of milling experts, resulted in increasing the capacity of the ordinary stamp mill by fifty per cent, adding many thousands of dollars to the value of the great copper properties, and inaugurating a revolution in this branch of engineering. Mr. Reynolds was a pioneer in the development of the modern pumping engine, and practically all of the recent high duty pumping engines in this country have either been built by the Allis company, or copied closely from their designs.

Mr. Reynolds has been the leader in the introduction of compound and triple expansion engines in factories and power houses. He was the first to build the low-speed, direct-coupled type of engine and generator, whose use is now the acknowledged standard of economic performance, and which, under the present impetus for centralization and consolidation, are no wmanufactured in units of 10,000 horsepower and upwards, the weight of a single engine closely approaching 1,000 tons. Some years ago the University of Wisconsin conferred on Mr. Reynolds the honorary degree of LL. D., and more recently placed his name on the frieze of its new engineering building, honors which without question have been fairly won. In his relations with his employes Mr. Reynolds has been eminently fair, and his appreciation of intelligence and fidelity have never been withheld.

British View of U. S. Steel Corporation.

The consolidation of producers will be more likely to produce cheaply than an individual, and there is much on the face of it, at least, to recommend such combinations. That the steel manufacturers of the United States will be able to produce more cheaply by their united action is more than probable. L'union fait la force. But how about the consumers? How, also, about the outside markets of the world, which it is the hardly-veiled aim of the American manufacturers to occupy to the fullest possible extent? There is not a little reason to suppose that if the schemes of American manufacturers and financiers are not defeated by internal dissensions European countries will find it more difficult to struggle against American competition with the new forces arrayed against them. It is not at all improbable that the new arrangements, resulting from these combinations, will enable American manufacturers to produce steel 10s per ton cheaper than would otherwise be possible. One authority assigns a saving of 5s to 6s per ton to the single fact that changing rolls will now hardly be necessary. There are other obvious and more or less considerable economies which must profoundly modify the old conditions. It therefore becomes worth while to consider how our own country is likely to stand in relation to this new movement.

If the American plan of campaign were likely to drive us into a tight place we should unquestionably be justified in looking to the Government to do something to protect our great industry from threatened ruin. But many things are likely to happen before then. We may even adopt the American system at home and "better the instruction." If consolidation is to be the final solvent and determinant of cheap production, and the retention of foreign markets, the system need not be limited to American experience.—[London Iron and Coal Trades Review.

The plant of the Pressed Steel Car Co. at Joliet, Ill., which was destroyed by fire Dec. 23 last, has been entirely rebuilt and operations were resumed last week.

VICTOR POWER HACK SAW.

Several patented features are embodied in the Victor power hack saw, of which we give an illustration. The most important of these is the friction disc, which completely takes the drag off the blade on the return stroke, thereby removing the chief cause of dull saw-blades; it being well known that the teeth of any kind of a saw-blade are more rapidly dulled by being pulled backward over the metal than by twice the number of forward strokes. The device consists of a partly cogged friction disc, the teeth of which work in a rack on the bed of the machine. This disc being connected with the saw-frame gives an absolutely positive feed on the forward stroke and automatically raises the blade on the return so as to clear the bottom of the cut, and while not adding to the cost of the machine, results in a considerable saving in the life of the blades.

The Victor saw will cut metals from ¼ inch to 5 inches in diameter, and the machine is automatically stopped when the cut is finished. The saw-frame proper swings upon one end of the carriage and is held in alignment by a guide at the other end. All of the guide bearings subject to wear are adjustable. The vise jaws swivel so as to admit of holding tapered stock and are adjustable from one end of the blade to the other, enabling the operator to use the entire length of the saw, resulting in further economy in the use of blades. The sliding weight upon the saw-frame is used to increase the pressure on the saw when doing heavy work. A stop is provided for holding the saw-frame out of the way while the work is being adjusted. Ten or 12-inch saw blades can be used. The machine is put upon the market by the Strong, Carlisle & Hammond Co., of Cleveland.

VICTOR POWER HACK SAW.

American Can Co.

The new tin can consolidation, known as the American Can Co., was incorporated in New Jersey on March 19 with a capital stock of $88,000,000. One-half of the stock is preferred, which is to pay 7 per cent cumulative dividends. The objects of the company are to manufacture and deal in cans and receptacles of all kinds; metal ware of all kinds, and machinery for making the same. It is understood that the various concerns acquired have been operated for the account of the new company since March 24. The official list of officers and directors of the American Can Co. is as follows: Edwin Norton, president; F. S. Wheeler, secretary and treasurer; H. B. Wheeler, assistant secretary and assistant treasurer. The vice-presidents are to be elected. Executive committee—D. G. Reid, W. B. Leeds, W. T. Graham, F. A. Assman, Edwin Norton, W. H. Moore and H. F. Akin. Directors—William H. Moore, J. H. Moore, D. G. Reid, W. B. Leeds, W. T. Graham, F. S. Wheeler, Warner Arms, Edwin Norton, C. S. Guthrie, H. F. Akin, James McLean, F. A. Assman, E. P. Breckenridge, F. Rudolph, H. W. Phelps, S. A. Ginna, W. M. Leeds, George G. McMurty, Henry Wick and Irvin Ayres.

Molders and Stove Founders Readily Agree.

The eleventh annual conference of the Iron Molders' Union of North America and the Stove Founders' National Defense Association was held on Wednesday and Thursday last week at the Auditorium, Chicago. It resulted in the readoption of the scale of last year, which was the scale of 1898, plus 15 per cent. The scale of 1899 was an advance of 10 per cent over that of the previous year and in 1900 an additional 5 per cent became effective. The new scale became operative April 1, 1901, and continues until and including March 31, 1902. It was generally anticipated that the founders would ask for a modification of the scale, but the re-affirmation of the old scale met with favor from both molders and founders and the result was reached without difference of opinion.

A number of changes were made, however, in the shop rules and regulations, some at the initiative of the founders; others at the request of the molders. The details were referred to two committees and their reports were later harmonized to the satisfaction of all the conferees. At the conference the Iron Molders' Union was represented by President Martin Fox and David Black, of Cincinnati; William Rogers, of Chicago; John Recktenwald, of Louisville, Ky.; Daniel M. Shalkop of Philadelphia, and Thomas H. O'Neil of Detroit. For the Stove Founders' Association the following appeared; Jeremiah Dwyer, Detroit; A. C. Mott, Philadelphia; Geo. H. Holland, St. Louis; Thomas McAfee, Quincy, Ill.; E. W. Peck, Rochester, N. Y.; Chauncey H. Castle, Quincy, Ill., and Thos. H. Hogan, secretary of the association.

The Pressed Steel Car Co., of Pittsburg, is establishing a new record so far as daily output is concerned. In the week ending March 16, the company built and shipped 636 freight cars, a daily average of 106 cars. The shipments consisted of 467 hopper cars and 169 box cars.

Regarding the business outlook, President Palmer of the American Steel and Wire Co. is quoted as follows: "We are in the midst of an enormous business and the product of our entire capacity is being purchased on a basis of maintained prices. There is absolutely no accumulation in the stocks of finished materials on our part or that of the middlemen. Export business is growing better and prices are well held, with an advancing tendency. Goods are being marked up where justifiable and reports to the contrary are erroneous. Our shipments to South Africa and China are curtailed, because war prevails in those countries, but the gains in the sales throughout the rest of the civilized world, where there is a market for our products, have been sufficient to offset the loss."

The Eclipse Manufacturing Co. of Pittsburg has been granted a Pennsylvania charter with a capital of $50,000. The new company will manufacture iron and steel forgings and has already erected a plant at 38th and Sassafras Streets, Pittsburg. The main building is 75x150 feet in size.

The New York Central Railroad, according to F. L. Chase, bridge engineer, expended last year nearly $2,000,000 for bridge work, and this year will expend an equal amount. A few days ago the company asked for bids on 28,000 tons of steel work, comprising several hundred spans. This is the largest single contract for bridge material ever let by any railroad company in the United States, and the contract for the whole lot was awarded to the American Bridge Co.

The American Bridge Co. has in contemplation a scheme for educating young men as engineers. The company will open technical schools where lads graduated from grammar schools will be apprenticed for four years, and taught engineering, drawing and other necessary technical branches. The apprentices will be paid $3.50 a week for the first year, with an increase of $1 a week each year until apprenticeship is completed. At the completion of the course the young men, specially fitted for the needs of the company, will be given positions in the various departments. The whole system will be based on ability and ambition, and exceptionally good work will shorten the time of apprenticeship.

The *Gazette* of Cologne, Germany, in describing the present crisis in the iron trade in Germany, says some firms already owe their bankers more than their share of capital. The balance sheets just issued, especially by the rolling mills, show a deplorable condition of affairs. If the present depression continues, the paper says, many failures are inevitable.

INSTRUCTION IN FOUNDRY PRACTICE AT THE UNIVERSITY OF ILLINOIS.*

BY D. T. RANDALL, URBANA, ILL.

The shops of the mechanical engineering department contain a well-equipped machine shop, a forge shop, and the foundry. The foundry has a molding room 48x48 feet, with a 20x30 foot cupola room added on one side as a wing to the building. The walls are of brick, the windows are large and are placed about six feet from the floor. Light is also admitted from above through the clerestory windows, which are hinged and may be easily adjusted from the floor, an arrangement which provides for perfect ventilation. The cupola is a Whiting No. 1, lined to 22 inch inside diameter, and the blast is furnished by a No. 7 "Buffalo" blower. A brass furnace, manufactured by the American Gas Furnace Co. is installed at one side of the molding room, and near by is the brass molders' tub. The core oven is of brick, built into the cupola room with double doors opening into the molding room. It is 6x8x7 feet, and is provided with movable shelves for cores and dry-sand molds. A line shaft runs through the foundry and furnishes power to the blower, a grinding stand and a rattler. A Pridmore molding machine fitted with gear patterns furnishes a means of comparing hand molding with machine work. There is also a full supply of crucibles, ladles, tongs, flasks, brushes, and small tools. On the side opposite the cupola a molding bench extends along the wall. The larger work is bedded in the floor near the cupola.

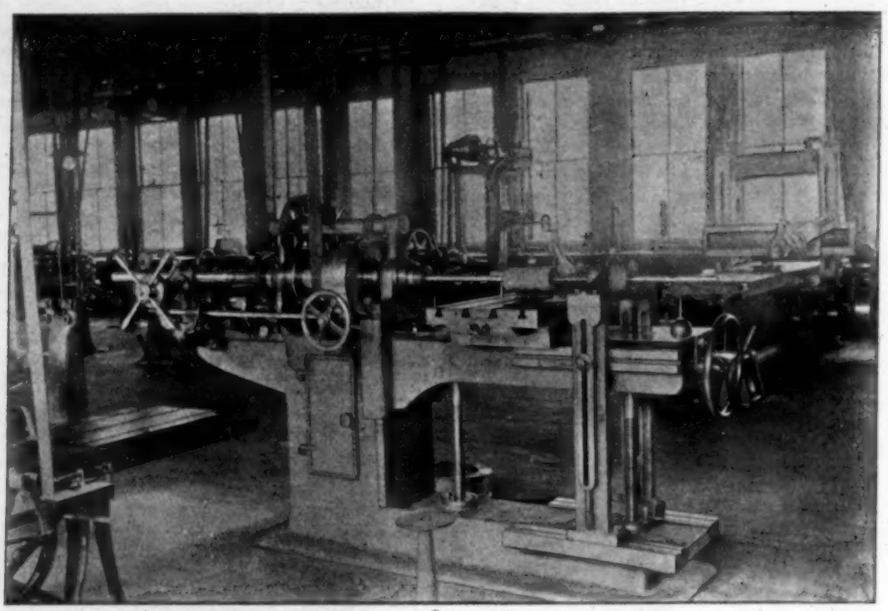


FIG. 1.—HORIZONTAL BORING MILL, DESIGNED AND BUILT IN MECHANICAL ENGINEERING DEPARTMENT SHOP.

It is the policy of the mechanical department to have some machine under process of construction each year, which will give the students good shop instruction and which when finished will add to the useful machines in the shop or laboratory. The boring mill shown in cut No. 1 was designed and built at the University shops. At present a tandem compound steam engine, having a nominal rating of 65 horse power, is furnishing shop practice for the several departments. Cut No. 2 shows a collection of cores prepared for this engine, and cuts Nos. 3 and 4 show the high pressure cylinder and the fly wheel as they came from the molds. Cuts Nos. 5 and 6 show methods used in molding the fly wheel in green and dry sand. This wheel is 72 inches in diameter, weighed about 2,800 lbs., and is being finished in the machine shop.

FIG. 2.—CORES FOR HIGH PRESSURE CYLINDER 65 H. P. TANDEM COMPOUND ENGINE.

*Prepared for the April meeting of the Foundrymen's Association.

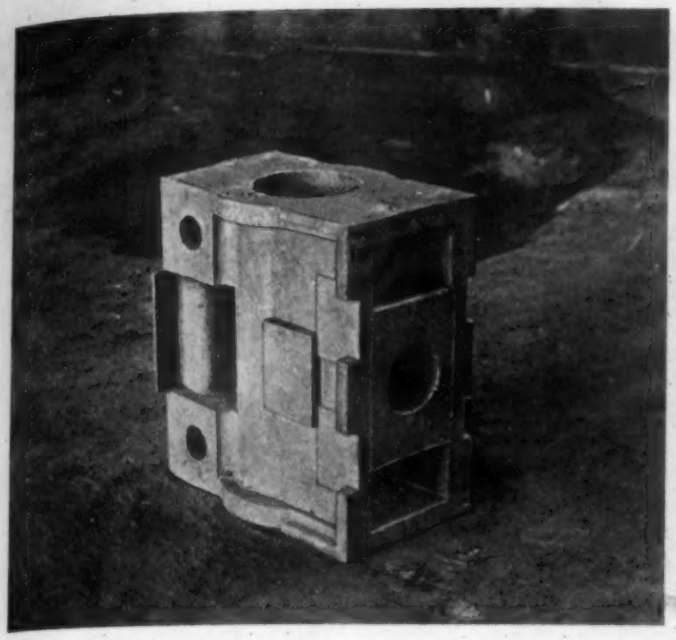


FIG 3.—HIGH PRESSURE CYLINDER

The College of Engineering provides instruction in the following branches: Architecture, architectural engineering, civil engineering, electrical engineering, mechanical engineering, municipal and sanitary engineering, railway engineering. Students in all of the above courses, except the first two, are required to do shop work during their first year to the amount of nine hours per week. Instruction in wood work covers a period of eighteen weeks; in forge work, nine weeks; in foundry practice, nine weeks. Only students in electrical and mechanical engineering courses are required to do shop work in the second year. These students work in the machine shop seven and one-half hours per week during the entire school year.

An estimate of the total number of hours each student receives shop instruction will show that but little time is really given to it, and that but little more than the principles and theory can be taught. Owing to this their work in the foundry is of necessity largely exercise work designed to illustrate the principles of molding, involving the use of patterns, sweeps and cores in making green and dry sand molds. Each student is also taught to care for the cupola, to make it ready, to charge it, and to tap and pour the iron. A considerable amount of repair work from other departments of the University comes to the foundry, very much as does work to a small jobbing foundry. Students do as much of this work as possible. At times more work comes than can be handled by the foreman and the inexperienced students. In such a case a molder is hired for a time to assist the foreman. The foreman is a man who has had a number of years' experience in commercial foundries.

After the students have gone through a course of shop instruction, it is not expected that they will be pattern makers, molders or machinists. However, they are encouraged to become as proficient as possible, and many students have done very good work in commercial shops after two years' instruction in shop practice. The main object of the college is to train engineers. It has been found best to put shop instruction on the same basis as mathematics, literature, chemistry and other subjects that are helpful to engineers. A considerable number of students obtain employment in shops during vacations and thus earn money for the following year at college, and at the same time round out the knowledge gained in the school.

Besides the students taking the regular course, the university provides for men over 21 years of age, who have the ability to take the work they desire, by admitting them for special work in any branch of engineering. For example, if a young man desired to perfect himself in foundry management, he might make arrangements to do work in chemistry and foundry practice only.

At first thought it may seem that a school foundry ought to do a great deal of experimental work. But when one considers that the duty of the foreman is to teach classes of young men who come to him with no knowledge of the foundry and are to receive instruction during a period of nine weeks only, it is clear that all his energies must be given to instructional work. Students in the senior class are encouraged to take up problems in the foundry for thesis work. Recently, for the first time, two students have expressed a desire to do experimental work and make a special study of foundry practice next year. During past years as well as present, there has been a greater demand for technical men than could be supplied; but of these requests few ever came from the foundries. Prospects of employment have not been good enough to warrant engineering students to specialize in foundry work. If the foundries need technical men and are willing to offer the same inducements that other engineering enterprises do, a fair proportion of engineering students will give attention to that branch of work.

Just at present the university has no testing laboratory, owing to loss by fire last June, but it is confidently expected that a new laboratory will be provided before work begins next fall. A foundry record sheet has been prepared for use in the foundry and partial records are being made. It is hoped to make the records complete as soon as the new laboratory is completed

The mechanical engineering department will be glad to aid

FIG. 5.—MOLD FOR FLY WHEEL.

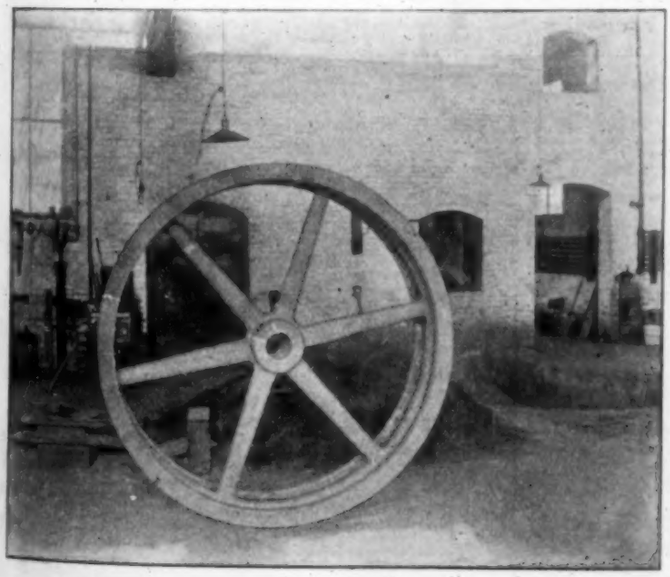


FIG. 4.—72-INCH FLY WHEEL FOR COMPOUND ENGINE.

in advancing the foundry interests, and will look upon any suggestions to that end from foundrymen as additional encouragement to do so.

Westinghouse, Church, Kerr & Co. of New York have been awarded a contract for the furnishing of a steam plant to be installed at the Piesa Lesa electric lighting station at Lima, Peru. The station is at present operated by hydraulic power, but the frequent scarcity of water in the immediate vicinity does not permit of its working very regularly. The auxiliary plant will consist of a 200-h. p. boiler built by the Babcock & Wilcox Co. of New York City, heating apparatus manufactured by the National Pipe Bending Co. of Bridgeport, Conn., pumps from the Deane shops of the International Steam Pump Co., while the condensers will be of Worthington manufacture. The contract also calls for a 16-inch compound engine, which will be built by the Westinghouse Machine Co. of Pittsburg. There will also be the requisite piping, fixtures and all other accessories pertaining to a complete plant. Shipment will be made inside of 90 days.

The American Bridge Co. has been awarded the contract for the erection of the steel mill buildings for the new sheet plant of the Youngstown Iron & Steel Roofing Co. at Youngstown, O. The Meehan Boiler & Construction Co. of Lowell-

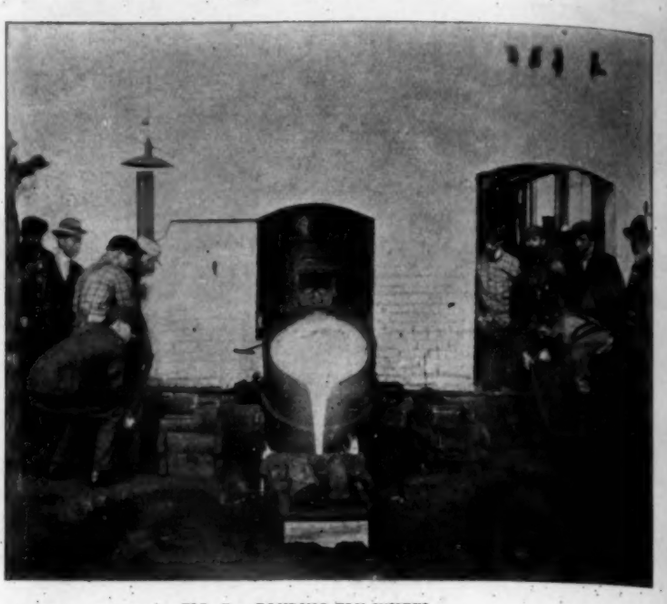


FIG. 7.—POURING FLY WHEEL.

FIG. 6.—MOLD FOR FLY WHEEL.

ville, O., has the contract for four waste heat boilers for the plant. Two will have a capacity of 200-h. p. each; another of 150-h. p. while the third will be of 125-h. p.

The Pittsburg Shovel Co. have leased a plant at Leechburg, Pa., where they will begin operations about July 1. Much of the necessary machinery has already been ordered. The company is controlled by Pittsburg capital. W. S. Horner, the president, and George S. Phillips, vice-president, are members of the firm of Goff, Horner & Co., steel and iron dealers. L. V. Walsh, the treasurer, is connected with the same firm. W. L. Walker, of Leechburg, is secretary of the new company. The company's capital is $100,000, which is to be increased after the Leechburg plant gets well under way.

Messrs. Charles H. Besly & Co., Nos. 10 and 12 North Canal St., Chicago, Ill., report that as Western representatives they carry a complete stock of the Pecora machinery paints which have been on the market since 1862. Flat steel color is in paste form for engines, tools and general machinery. Egg shell gloss enamel is a finishing paint for engines, tools and general machinery. Dresden machine enamel is designed for radiators, gas engines, etc. Iron filler is designed for making rough castings smooth. Pecora blow hole cement will stand under the planer, lathe, file and other finishing operations. It comes dry and is worked with a knife. C. H. Besly's new catalogue is ready for distribution and will be mailed to any address.

The Anniston Rolling Mill Co., whose plant is located at Anniston, Ala., is fast getting its mill ready for operation. The muck mill has already started up and it is the intention to operate the remainder within two weeks. One of the products will be light rails, 16-pound and under. An 8-inch guide mill is also to be installed.

The plant of the Rogers Locomotive Works at Paterson, N. J., has been sold by the receivers to a number of New York capitalists. It is the intention of the purchasers to make immediate improvements on the plant and to operate at an early date.

The four sheet mills and the two sheet bar mills at the Falcon plant of the American Sheet Steel Co. at Niles, O., will be placed in operation. The plant has been idle nearly a year, but owing to the pressing demand for sheets, the American Sheet Steel Co. is compelled to resume at many of its idle plants, some of which it was undoubtedly decided to abandon.

At the annual meeting of the stockholders of the Tidewater Steel Co. of Chester, Pa., directors were elected as follows: C. B. Houston, E. R. Dick, I. N. Solis, C. A. Porter, F. W. Wood, R. H. Rushton, G. S. Graham, George McCall and A. S. L. Shields.

FIG. 8.—CLASS IN FOUNDRY PRACTICE.

ANALYSES OF LAKE SUPERIOR IRON ORES.

The various firms handling Lake Superior iron ores have cooperated in the usual way in the preparation of their annual exhibit of cargo analyses of ores from the various ranges. A reproduction of the sheets just issued is given below. It will be noticed that the new Canadian mine appears this year, making a range by itself. The upper line of figures opposite each ore represents its analysis when dried at 212 degrees Fahrenheit; the lower line, the analysis of the ore in its natural condition.

Referring to the several special marks that appear in the tables: For ores marked by the asterisk (*) the expected

MARQUETTE RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Abbaford	63.160	.020	7.060	.122	1.725	.355	.130	.013	.370	
	61.775	.0088	6.911	.1194	1.7572	.3490	.1302	.0170	.3623	2.10
Alford†	54.43	.042	4.76	.....	.....	.....	.....	.....	.....	
	47.80	.068	4.37	.....	.....	.....	.....	.....	.....	10.29
Angeline, Hard	66.61	.012	.....	.....	.....	.....	.....	.....	.....	
	60.39	.012	.....	.....	.....	.....	.....	.....	.....	4.08
Angeline, Hard No. 2*	65.00	.020	.....	.....	.....	.....	.....	.....	.....	
	63.27	.019	.....	.....	.....	.....	.....	.....	.....	3.60
Angeline, Hematite	64.41	.044	.....	.....	.....	.....	.....	.....	.....	
	57.31	.039	.....	.....	.....	.....	.....	.....	.....	11.08
Angeline, Soft	60.83	.061	6.65	.12	1.52	.25	.12	.022	8.67	
	53.76	.072	6.00	.10	1.34	.22	.11	.019	8.24	11.42
Bonifer*	59.15	.20	7.01	.23	.46	2.80	2.70	.082	11.92	
	56.14	.21	6.65	.21	.42	2.58	2.49	.078	10.87	4.89
Bell	59.66	.036	10.02	.....	.....	.....	.....	.....	.....	
	58.589	.035	10.04	.....	.....	.....	.....	.....	.....	2.26
Bethel	59.57	.140	8.46	.....	.....	.....	.....	.....	.....	
	53.51	.093	7.56	.....	.....	.....	.....	.....	.....	10.56
Bessford†	63.06	.092	5.49	.....	.....	.....	.....	.....	.....	
	62.57	.091	5.46	.....	.....	.....	.....	.....	.....	.78
Bigelow	60.40	.046	22.74	.12	2.196	.24	.10	.016	2.33	
	46.097	.0419	20.70	.109	1.980	.219	.09	.0146	2.127	8.78
Buffalo†	61.02	.160	4.86	.22	.....	.....	.....	.....	.....	
	54.46	.038	4.30	.20	.....	.....	.....	.....	.....	11.56
Cambria	60.41	.059	6.04	.06	2.05	.06	.32	.010	2.71	
	53.699	.047	5.99	.07	2.037	.06	.38	.0089	2.698	11.11
Cambridge	60.61	.094	5.05	.20	1.00	1.24	.56	.055	1.66	
	53.17	.0257	5.7163	.3414	.0092	1.1543	.4859	.0045	1.6380	12.78
Castleford†	57.09	.086	11 03	.....	.....	.....	.....	.....	.....	
	57.14	.086	11.42	.....	.....	.....	.....	.....	.....	.96
Champion No. 1 Crushed*	64.00	.060	4.85	.20	2.38	.32	.20	.013	.....	
	60.40	.0305	4.51	.199	2.36	.317	.252	.0139	.....	.50
Champion, Hematite*	52.00	.60	12.00	.04	2.60	2.20	1.80	040	4.09	
	48.10	.57	11.19	.074	2.78	2.04	1.67	.037	3.78	7.39
Chatford†	51.72	.117	20.90	.....	.....	.....	.....	.....	.....	
	46.85	.106	18.97	.....	.....	.....	.....	.....	.....	9.25
Chester, Non-Bessemer	51.20	.084	19.60	.54	1.67	.05	.01	.010	1.85	
	46.716	.0780	18.200	.5156	1.7373	.0424	.0131	.0092	1.44	7.19
Chester, Siliceous	46.00	.039	32.10	.475	1.422	.32	.26	.006	2.12	
	38.72	.0278	26.68	.4400	1.3296	.2807	.2329	.0056	1.966	8.50
Cliffs Shaft, Lump	62.600	.096	3.120	.196	1.600	1.060	.810	.021	.980	
	62.180	.0946	3.100	.1954	1.5468	1.0730	.8071	.0209	.9967	.35
Cliffs Shaft, Crushed	62.400	.096	4.400	.100	2.230	1.320	.910	.024	1.160	
	61.730	.0949	4.352	.1780	2.2056	1.3056	.9000	.0237	1.1478	1.09
Colerain	55.100	.112	12.300	.106	4.180	.051	1.087	.035	1.590	
	54.490	.1107	12.220	.1049	4.1347	.0548	1.0753	.0347	1.5730	1.09
East New York	60.33	.030	9.02	.188	2.120	.32	.13	.010	2.16	
	54.45	.045	8.58	.1696	1.918	.307	.188	.016	1.949	9.74
Imperial	51.600	.206	13.490	.196	1.200	1.277	1.208	.011	7.280	
	46.020	.2299	12.097	.1775	1.0761	1.2945	1.2040	.0099	6.6183	10.23
Jackson Pit†	54 43	.073	14.55	.31	2.20	.38	.09	.041	4.85	
	50.94	.068	13.59	.29	2.10	.36	.08	.038	4.54	6.60
Jackson, South	64.13	.050	21.45	3.63	1.33	Trace.	.08	.....	.....	
	60.0701	.05886	20.2045	3.5615	1.2915	Trace.	.0745	.....	.....	7.16
Lake	59.000	.104	6.170	.227	3.110	.357	.276	.015	3.650	
	51.702	.0903	5.388	.4576	2.7010	.3100	.2383	.0113	3.1700	13.15
Lake Superior	62.30	.039	5.470	.271	1.160	.204	.151	.010	1.440	
	56.641	.0357	4.986	.2460	1.4110	.1811	.1340	.0088	1.2784	11.22
Lillie	61.46	.066	5.51	.18	2.16	.26	.06	.012	2.77	
	53.67	.0742	4.70	.33	1.879	.31	.069	.010	2.41	12.98
Marquette	58.30	.042	10.06	.....	.....	.....	.....	.....	.....	
	57.63	.0409	10.036	.....	.....	.....	.....	.....	.....	2.42
Michigamme	60.060	.092	9.020	.102	2.475	.810	.774	.027	4.170	
	59.702	.0907	9.547	.1499	2.4413	.8049	.7935	.0268	4.1077	1.35
Norfolk, Crushed*	55.00	.060	13.00	.17	3.20	.57	.30	.032	.....	
	54.46	.0594	12.87	.168	3.27	.564	.555	.0317	.....	.99
Princeton No. 1	62.30	.056	6.30	.30	.88	.77	.81	.005	1.65	
	51.06	.0460	5.4093	.2463	.8145	.64	.6730	.0004	1.3714	18.88
Princeton No. 2	60.00	.177	9.05	.30	1.04	.93	.75	.006	1.70	
	51.47	.1518	7.7639	.2573	.8922	.7984	.6434	.0043	1.4584	14.31
Republic Specular	67.66	.057	2.40	Trace.	.50	.06	.062	.020	.....	
	66.396	.0366	2.346	Trace.	.383	.059	.0611	.0195	.....	1.09
Republic Kingston	64.72	.048	4.50	.14	1.30	.42	.30	.047	.....	
	60.991	.0474	4.108	.139	1.245	.434	.305	.0455	.....	1.18
Republic Magnetic (N.P.)*	69.60	.12	3.30	.147	.664	.30	.216	.021	.40	
	68.31	.118	3.197	.145	.627	.189	.213	.0207	.445	1.09
Rose	60.68	.150	6.17	.31	2.45	.51	.17	.020	2.90	
	53.97	.131	5.39	.27	2.14	.446	.148	.0202	2.536	12.94
Richmond	43.90	.024	26.20	.049	.840	.490	.110	.004	2.740	
	43.05	.023	25.74	.050	.823	.48	.100	.004	2.75	1.279
Salisbury	60.060	.108	7.250	.242	2.460	.455	.405	.011	2.810	
	52.170	.0939	6.309	.2106	2.1380	.3947	.4060	.0095	2.3893	13.05
Scotch	57.700	.122	10.640	.109	4.220	.866	.674	.019	.720	
	56.972	.1204	10.505	.1058	4.1680	.8705	.6629	.0187	.7098	1.26
Shelfield	58.48	.095	.....	.....	.....	.....	.....	.....	.....	
	56.21	.094	.....	.....	.....	.....	.....	.....	.....	3.01
Tilden Silica	41.280	.062	37.680	.096	1.920	.260	.220	.014	.640	
	40.326	.0233	37.141	.0941	1.4903	.2549	.2137	.0137	.6275	1.95

VERMILLION RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Chandler	63.90	.042	4.35	.29	2.44	.21	.10	Nom.	1.03	
	60.7467	.03987	4.0345	.2703	2.3163	.1994	.0949	Nom.	.9779	5.07
Chandler Lump	66.04	.041	2.85	.....	1.68	.....	.....	.....	.....	
	64.1848	.03985	2.7700	.....	1.7786	.....	.....	.....	.....	2.81
Jane	61.02	.074	4.52	.....	.....	.....	.....	.....	.....	
	56.90	.073	3.75	.....	.....	.....	.....	.....	.....	7.86
Long Lake	62.55	.045	7.85	.08	2.30	.44	.15	Trace.	1.80	
	58.5818	.04295	7.3704	.0751	2.1579	.4131	.1409	Trace.	1.6904	6.11
Pioneer	62.24	.041	5.49	.....	.....	.....	.....	.....	.....	
	59.97	.039	5.08	.....	.....	.....	.....	.....	.....	3.69
Pilot	66.46	.034	2.70	.....	.....	.....	.....	.....	.....	
	64.56	.033	2.71	.....	.....	.....	.....	.....	.....	2.66
Red Lake	62.10	.129	5.85	.18	1.61	.47	.47	Trace.	.80	
	61.3989	.12686	5.7301	.1765	1.7729	.4604	.4604	Trace.	.7826	2.06
Soucy	63.57	.051	3.44	.....	.....	.....	.....	.....	.....	
	59.30	.040	3.21	.....	.....	.....	.....	.....	.....	6.71
Soudan	65.62	.087	3.97	.02	.96	.43	.38	Trace.	.42	
	64.8851	.08603	3.9265	.0190	.9500	.4251	.3571	Trace.	.4202	1.11
Vermilion	66.70	.130	3.77	.07	1.43	.86	.38	Trace.	.57	
	65.0660	.12673	3.7361	.0693	1.4160	.8345	.3763	Trace.	.5644	.66
Vermilion Lump	67.06	.135	2.04	.....	1.29	.....	.....	.....	.....	
	66.0914	.13419	2.0094	.....	1.2727	.....	.....	.....	.....	.02
Zenith	64.66	.037	5.00	.....	.....	.....	.....	.....	.....	
	60.69	.035	4.69	.....	.....	.....	.....	.....	.....	6.14

MENOMINEE RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Armenia*	50.30	.17	5.60	.20	1.20	2.10	.97	.060	3.50	
	53.04	.15	5.22	.18	1.08	1.80	.87	.055	3.05	10.60
Ajax	54.00	.061	10.35	.56	2.06	1.53	4.12	.021	3.70	
	50.230	.0560	9.440	.52	1.93	1.450	3.84	.019	3.13	6.70
Burton†	57.50	.60	6.11	.....	.....	.....	.....	.....	.....	
	53.55	.56	5.82	.....	.....	.....	.....	.....	.....	7.09
Bush*	56.40	.24	4.72	3.10	4.40	2.10	.80	.080	3.10	
	50.19	.21	5.01	4.72	1.90	1.84	.85	.085	2.67	7.40
Brunswick†	57.76	.05	4.80	.....	.....	.....	.....	.....	.....	
	50.64	.39	4.60	.....	.....	.....	.....	.....	.....	12.32
Cedar	59.50	.140	9.30	.56	2.87	1.24	2.35	.165	4.75	
	48.37	.105	7.40	.396	2.03	1.70	1.50	.130	3.66	9.02
Chapin	57.629	.0220	7.30	.40	1.48	1.24	2.35	.014	3.05	
	53.80	.0087	6.797	.49	1.38	1.157	2.137	.013	2.839	6.690
Clifford	60.33	.017	30.65	.20	.51	.20	.20	.005	.30	
	59.55	.0165	37.63	.25	.50	.20	.20	.0050	.28	2.54
Columbus	50.20	.67	7.24	.20	2.12	1.10	.72	.040	1.08	
	52.54	.615	6.67	.177	1.976	.97	.67	.0307	1.703	11.43
Crystal Falls	56.50	.737	4.57	.56	1.61	2.40	.60	.060	2.360	
	53.53	.674	4.18	.51	1.47	2.19	.55	.057	1.96	6.50
Davidson	56.96	.114	6.77	.33	2.70	.92	2.45	.223	4.11	
	51.34	.105	6.10	.30	2.53	.83	2.21	.201	3.70	9.97
Florence	54.63	.313	6.44	.40	3.79	1.51	2.97	.127	5.68	
	49.30	.281	5.80	.35	3.41	1.36	2.67	.114	4.69	9.80
Grundy*	60.77	.090	5.23	.14	1.30	.84	2.00	.023	1.68	
	55.92	.055	4.81	.13	1.20	.77	2.45	.021	1.66	7.92
Great Western	50.80	.575	5.05	.64	1.05	2.10	.60	.080	3.10	
	46.76	.543	4.65	.59	1.51	1.93	.76	.065	2.84	6.49
Hemlock	56.32	.245	6.27	.35	2.80	1.90	1.74	.011	4.13	
	54.0279	.23503	6.0143	.3358	2.686	1.8229	1.6692	.0105	3.9619	4.27
Hiawatha*	56.000	.300	7.400	.200	2.000	.350	.410	.070	3.100	
	51.520	.276	6.808	.184	1.840	.322	.377	.0644	2.852	8.080
Hilltop*	54.03	.310	6.50	.33	2.84	1.07	1.19	.095	7.20	
	50.34	.751	5.90	.31	2.61	1.47	1.09	.0866	6.62	6.93
Hope*	62.10	.101	4.30	.21	1.39	1.51	.84	.052	3.15	
	57.15	.176	3.96	.19	1.10	1.40	.59	.0505	2.90	8.08
Kool Ridge*	60.04	.086	37.43	.20	.80	1.35	1.00	.095	.....	
	59.46	.085	30.33	.19	.67	1.31	.97	.0858	.....	2.90
Lamont	57.00	.72	4.15	.55	1.34	2.01	1.10	.092	2.10	
	52.70	.66	3.80	.55	1.15	2.50	1.01	.085	1.93	8.30
Lerida	63.09	.105	4.40	.18	1.05	.76	1.04	.092	2.25	
	58.14	.095	4.06	.17	1.24	.65	1.04	.089	2.07	7.84
Lincoln	59.10	.320	5.10	.42	1.070	1.070	.720	.040	2.040	
	54.02	.347	4.66	.38	1.52	1.30	.654	.035	2.00	8.60
Loretto	57.30	.010	13.31	.23	1.09	.25	.07	.007	1.01	
	50.77	.011	11.11	.200	1.73	.210	.060	.004	.897	9.97
Magnetic	49.40	.021	6.10	5.20	2.04	2.05	1.15	.010	9.70	
	48.17	.021	4.95	5.04	1.99	2.45	1.10	.010	9.54	4.71
Millie	61.60	.063	8.80	.10	.92	1.06	1.70	.060	3.24	
	57.41	.0518	8.10	.178	.88	1.4367	1.5847	.0603	3.0483	5.85
Blatch	52.15	.074	9.55	.20	1.32	.61	1.55	.065	1.47	
	57.34	.083	9.15	.25	1.25	.55	1.49	.035	1.35	7.74
Paint River*	57.40	.06	6.10	.40	1.90	1.96	1.41	.060	3.60	
	52.09	.59	5.43	.36	1.69	1.74	1.25	.057	3.20	11.90
Peavine	62.94	.013	6.00	.11	.70	.65	1.20	.032	1.19	
	56.0094	.01210	6.4091	.1054	.6710	.6227	1.1515	.0310	1.1390	6.80
Peavine Goose	63.20	.060	32.00	.06	1.39	.76	1.16	.004	1.34	
	61.1460	.06005	30.9708	.0700	1.3114	.7222	1.1002	.0036	1.2786	4.97
Quinnesec No. 1*	64.10	.031	2.80	.21	.53	.15	.21	.020	2.10	
	60.15	.029	2.63	.20	.53	.17	.20	.008	1.97	6.80
Quinnesec Non-Bess.*	64.16	.135	2.75	.20	.90	.18	.21	.006	3.14	
	60.38	.127	2.59	.19	.84	.17	.20	.006	2.95	6.10
Quinnesec (Siliceous Ore)	47.20	.020	20.00	.12	1.02	.07	.33	.004	2.00	
	46.51	.020	20.45	.12	1.00	.06	.31	.004	1.74	2.10
Russell	64.20	.065	12.75	.20	2.45	2.00	2.04	.021	4.70	
	47.67	.0600	11.779	.186	2.265	1.85	1.887	.019	4.40	7.47
Sanborn	56.75	.471	9.54	.36	1.10	1.80	.55	.020	2.43	
	50.76	.421	8.529	.32	0.98	1.61	.49	.0180	2.319	10.55
San Jose	64.84	.016	4.03	.34	1.06	.34	.33	.016	.66	
	58.80	.014	4.116	.300	1.00	.310	.30	.0145	.59	9.29
Shafer	56.40	.300	14.30	.22	1.46	.97	.48	.021	1.09	
	49.56	.275	12.70	.20	1.365	.775	.41	.0197	1.758	10.59
Tobin*	61.10	.24	5.20	.21	1.60	1.86	.90	.007	3.10	
	56.01	.22	4.79	.19	1.47	1.24	.84	.006	2.85	8.00
Toledo	52.16	.013	20.35	.11	1.10	1.19	1.15	.005	1.42	
	49.1947	.01130	19.1697	.1038	1.0363	1.1210	1.0833	.0018	1.3376	5.80
Tyrone	57.77	.077	10.20	.15	1.93	1.40	2.44	.060	3.16	
	53.1807	.07090	9.3939	.1380	1.707	1.2894	2.2465	.0554	1.9078	7.97
Walpole	56.90	.110	13.05	.15	1.04	1.15	2.00	.300	1.58	
	50.8024	.11000	11.4077	.1450	1.4079	1.0060	1.7484	.0028	1.4060	8.33

GOGEBIC RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Ashland	61.41	.044	.....	.....	.....	.....	.....	.....	.....	
	54.536	.0391	.....	.....	.....	.....	.....	.....	.....	11.02
Anvil*	62.00	.030	5.05	.90	.80	.70	.14	.02	2.00	
	54.56	.014	4.444	.793	.500	.1804	.1323	.0176	2.344	12.00
Aurora†	62.12	.021	5.09	.....	.....	.....	.....	.....	.....	
	55.30	.020	5.10	.....	.....	.....	.....	.....	.....	10.83
Bon	54.01	.061	17.70	1.04	1.50	.90	.96	.019	3.03	
	47.55	.0539	15.61	.90	1.30	.855	.81	.016	2.66	13.15
Bessie	51.28	.032	11.44	3.89	1.49	.15	.75	.055	4.81	
	46.06	.028	10.187	3.605	1.326	.13	.65	.023	4.23	10.20
Brotherton	62.05	.020	7.20	.45	.70	.36	.04	.026	1.30	
	56.311	.0260	6.49	.5470	.0472	.3264	.0260	.0071	1.079	10.24
Buckeye*	59.20	.031	10.50	.45	1.97	.54	.45	.033	.....	
	51.73	.071	9.18	.38	1.72	.47	.40	.023	.....	12.61
Cary Eagle*	56.45	.050	8.60	2.96	.71	.15	.09	.026	5.85	
	52.5466	.04705	8.2934	2.578	.6263	.1349	.0870	.0233	5.3992	10.10
Colby No. 1	56.70	.046	5.30	6.600	.880	.160	.460	.006	2.200	
	51.09	.060	5.21	6.305	.801	.145	.394	.005	2.00	9.930
Colby No. 2	60.60	.020	4.00	2.30	1.10	.17	.47	.008	2.15	
	54.66	.072	3.91	2.00	.90	.15	.43	.007	1.94	9.80
Hemlock	59.23	.045	.....	.....	.....	.....	.....	.....	.....	
	52.308	.040	.....	.....	.....	.....	.....	.....	.....	9.660
Iron Belt	60.30	.044	9.45	.32	1.73	.33	.14	.013	2.44	
	53.54	.039	7.96	.28	1.54	.30	.13	.011	2.17	11.24
Ironton	62.10	.050	5.40	.70	1.30	.34	.11	.006	2.150	
	55.64	.045	4.84	.63	1.16	.30	.10	.007	1.926	10.40
Jack Pot	56.97	.069	.....	.....	.....	.....	.....	.....	.....	
	48.61	.084	.....	.....	.....	.....	.....	.....	.....	13.09
Lawrence	60.57	.069	6.60	.50	1.59	.60	.086	.007	3.07	
	53.61	.055	7.12	.45	1.42	.58	.067	.004	2.53	10.36
Lyon*	58.90	.065	.....	.....	.....	.....	.....	.....	.....	
	52.79	.0561	.....	.....	.....	.....	.....	.....	.....	9.99
Melvas	61.87	.062	5.24	1.68	1.97	.19	.13	.015	3.06	
	54.32	.039	4.609	.91	.54	.167	.11	.011	0.498	11.66
Melvas No. 2	60.73	.040	5.73	1.14	1.08	.11	.13	.007	4.20	
	53.80	.0430	5.15	1.01	.953	.097	.116	.0140	3.695	11.19
Menot	63.07	.066	4.10	.840	.660	.650	.080	.004	2.940	
	58.20	.061	3.76	.49	.60	.60	.05	.004	2.62	8.700
Mikado	58.10	.139	15.06	.35	1.10	.34	.17	.010	3.36	
	50.1094	.11916	13.0867	.3025	.9429	.3073	.1468	.0086	1.8951	13.05
Newport	60.72	.052	2.60	.60	.35	.21	.14	.005	2.05	
	60.04	.051	2.49	.61	.33	.19	.13	.0049	1.99	7.75

New Davis	47.01 48.93	.045 .04139	11.02 10.1869	0.54 0.7729	.....	.....	.....	.....	.....	.....	.....	0.04
New Era	50.02 50.90	.020 .035	10.17 8.92	1.13 .90	1.37 1.11	.21 .16	.13 .11	.011 .0008	3.49 3.04	.....	.....	12.36
Newport	50.13 50.52	.021 .0277	4.19 3.74	0.22 0.88	.81 .72	.22 .19	.13 .13	.020 .007	5.15 4.60	.....	.....	10.58
Norlet†	62.87 63.93	.041 .037	4.73 4.35	.....	.....	.....	.....	.....	.....	.....	.....	10.01
Norlet†	63.11 65.68	.078 .067	3.26 2.87	.....	.....	.....	.....	.....	.....	.....	.....	11.02
Ottawa*	57.00 51.73	.055 .054	9.00 7.28	0.16 2.87	1.34 1.16	.35 .28	.35 .25	.011 .009	5.00 3.54	.....	.....	9.95
Ottawa Mang.*	55.55 50.85	.054 .049	8.35 8.05	7.44 6.80	1.25 1.14	.25 .23	.080 .046	.090 .080	5.00 5.30	.....	.....	9.00
Palms	61.16 52.16	.055 .0480	.....	.....	.....	.....	.....	.....	.....	.....	.....	14.76
Pike*	62.00 57.33	.060 .0720	6.50 5.915	.....	.....	.....	.....	.....	.....	.....	.....	9.00
Portal†	57.63 51.68	.035 .031	4.80 4.35	4.37 3.97	1.000 1.49	.430 .373	.110 .086	.006 .007	3.220 2.855	.....	.....	11.40
Rand†	61.75 53.83	.040 .035	2.96 2.56	2.41 2.11	.....	.....	.....	.....	.....	.....	.....	13.73
Rose*	57.00 50.16	.045 .0990	12.25 10.79	.90 .7920	.70 .6160	.20 .2604	.19 .1672	.02 .0176	3.16 2.772	.....	.....	12.00
Sunday Lake	53.00 50.320	.020 .0380	7.02 6.290	.40 .3004	1.09 .8769	.24 .2151	.08 .0443	.006 .0071	.97 .8692	.....	.....	10.40
Taylor	59.97 52.767	.035 .0493	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.01
Tilden†	62.30 54.97	.020 .043	2.89 2.51	.72 .63	.....	.....	.....	.....	.....	.....	.....	10.20
Wisconsin	59.20 53.01	.043 .04	4.00 3.58	2.200 2.042	1.80 1.92	.21 .19	.05 .07	.003 .007	2.120 .90	.....	.....	10.450

MESABA RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Adams	60.40 57.06	.060 .051	3.10 2.79	.33 .47	1.13 1.02	.17 .10	.10 .14	.030 .020	3.60 3.28	10.15
Adams, Non-Bess.*	60.78 54.52	.027 .060	3.57 3.15	.85 .49	2.21 1.98	.075 .067	.053 .030	.035 .032	.....	10.35
Admiral	64.60 59.24	.029 .027	4.30 4.17	.310 .296	.500 .547	.225 .304	.142 .151	.004 .004	2.110 1.804	7.400
Atlas	60.91 54.7805	.065 .05846	5.22 4.7048	1.09 .8394	1.09 1.4390	.38 .3818	.35 .3349	Trace Trace	4.57 4.1169	10.06
Aubrey	62.06 54.9346	.054 .04778	4.09 3.6194	.73 .6371	2.03 2.5643	.39 .3479	.18 .1633	Trace Trace	3.50 3.0971	11.51
Bangor	61.01 53.997	.046 .040	5.60 5.22	.59 .51	2.60 1.74	.39 .37	.17 .147	.006 .006	3.05 2.66	12.97
Beaver	62.52 56.36	.070 .063	2.62 2.33	.45 .399	1.94 1.72	.19 .163	.14 .12	.011 .0097	3.45 3.06	11.24
Bicobik	64.30 59.471	.037 .03422	2.40 2.2197	.64 .5919	.91 .8416	.17 .1572	.09 .0832	.030 .0277	3.76 3.4961	7.51
Commodore	63.10 57.23	.030 .026	4.16 3.78	.30 .18	1.21 1.10	.24 .22	.03 .05	.024 .024	3.40 3.09	9.39
Daisy	61.06 51.51	.038 .032	6.11 5.157	.71 .599	.93 .778	.21 .177	.10 .13	.045 .038	5.17 4.36	15.59
Duluth	59.97 52.663	.040 .0471	.....	.....	.....	.....	.....	.....	.....	11.55
Elba	63.35 57.06	.035 .031	3.73 3.37	.80 .51	1.66 .91	.37 .24	.15 .14	Trace Trace	3.73 3.35	9.37
Fayal	63.56 57.3029	.036 .03249	3.96 3.1580	.60 .5415	1.11 1.0016	.23 .2077	.13 .1052	None None	3.75 3.3844	9.75
Franklin	62.123 57.78	.035 .03255	.....	.....	.....	.....	.....	.....	.....	6.96
Genoa	62.90 56.9068	.039 .03533	3.80 3.5706	.50 .4072	.99 .9317	.26 .2330	.17 .1527	Trace Trace	3.70 3.0448	9.90
Hale*	60.00 54.60	.030 .0792	6.00 7.30	.30 .40	1.40 1.320	.60 .72	.07 .060	.014 .0126	2.30 1.560	10.00
Hartley	64.47 58.56	.037 .034	2.73 2.52	.30 .47	.95 .88	.19 .17	.18 .18	.008 .007	3.00 2.73	9.18
Hibbing	64.73 58.53	.035 .032	2.42 2.27	.50 .45	1.27 1.24	.28 .18	.05 .060	.010 .009	2.24 2.06	9.37
Juniata†	60.35 52.42	.050 .044	6.60 5.76	.61 .36	.....	.....	.....	.....	.....	12.99
Kanawha	60.30 54.45	.070 .0684	7.12 6.408	.45 .406	1.54 1.380	1.04 .935	.21 .189	.007 .0063	2.45 2.205	10.00
Linwood*	63.01 57.06	.054 .049	3.45 3.13	.90 .81	1.94 1.76	.14 .13	.08 .05	.025 .021	.....	9.45
Mahoning	64.35 57.38	.047 .0419	2.42 2.157	.40 .356	1.77 1.579	.17 .15	.12 .107	.009 .008	3.21 2.86	10.02
Malta	62.10 57.0182	.031 .02846	3.14 4.7179	.26 .3966	.96 .8011	.23 .3466	.20 .1686	Trace Trace	2.90 2.0016	8.72
Monroe*	62.20 57.01	.076 .069	4.90 4.42	.24 .22	1.10 .90	.24 .22	.26 .23	.020 .020	2.90 2.62	9.00
Mountain†	62.63 56.56	.043 .038	4.32 3.77	.26 .24	.....	.....	.....	.....	.....	12.68
Oliver†	62.47 54.99	.053 .047	4.63 4.06	.26 .24	.....	.....	.....	.....	.....	11.97
Pembroke	61.36 54.81	.036 .032	6.04 5.37	.73 .649	1.61 1.34	.30 .177	.13 .108	.012 .0106	3.41 3.02	11.07
Pillsbury	61.97 55.91	.039 .037	5.75 5.26	.49 .45	1.36 1.23	.24 .23	.15 .14	.008 .007	4.26 3.92	9.43
No. 2 Pillsbury*	60.00 54.00	.054 .049	5.41 4.95	.72 .66	1.80 1.10	.10 .60	.09 .05	.020 .006	.....	9.50
Prebat†	61.46 54.50	.060 .066	4.61 4.09	1.09 .97	.....	.....	.....	.....	.....	11.30
Roberts	61.04 55.3064	.030 .0264	7.74 7.021	.48 .4354	1.12 1.016	.79 .6531	.17 .1543	.006 .0072	2.08 1.8413	9.30
Sammy	62.70 56.71	.066 .059	3.41 3.08	.46 .42	1.26 1.77	.16 .14	.06 .07	.033 .032	4.50 3.71	9.56
Sellers	63.30 57.30	.041 .037	4.10 3.72	.49 .45	1.21 1.10	.15 .14	.07 .06	.026 .023	2.65 2.39	9.15
Sparta	62.90 57.0246	.027 .02488	6.06 5.5007	.32 .2926	.92 .8472	.18 .1664	.11 .1012	None None	2.33 2.1457	7.91
Stevenson	65.09 60.37	.029 .026	2.91 2.79	.21 .19	.70 .65	.21 .19	.19 .18	.008 .007	2.60 2.50	7.49
Top Brown	61.53 55.7329	.062 .05616	3.90 4.0290	.91 .8243	1.42 1.2862	.21 .3805	.05 .0453	Trace Trace	3.95 3.5779	9.43
Tubal*	61.27 56.41	.033 .031	4.80 4.05	1.14 1.05	1.08 1.76	.34 .22	.15 .14	.028 .025	.....	10.09
Thompson	63.79 58.98	.037 .033	2.71 2.506	.30 .43	.80 .77	.20 .17	.17 .145	.032 .045	3.01 2.585	13.41
Wales	60.54 56.68	.041 .0378	.....	.....	.....	.....	.....	.....	.....	6.11

MICHIPICOTEN RANGE.

ORE.	IRON	PHOS.	SILICA	MANG.	ALUMINA	LIME	MAGNESIA	SULPHUR	LOSS BY IGNITION	MOIST.
Helen	63.87 58.83	.105 .100	4.47 4.250	.10 .09	.54 .50	.15 .14	.10 .09	.08 .230	2.00 2.00	4.71

analysis for the season of 1901 was given. The dagger (†) denotes analyses made at the mine of season shipments. The paragraph mark in the "loss by ignition" column opposite the Michigamme ore, Marquette range, indicates that in the case of this ore there was a gain rather than a loss:

The Oil City mills of the National Tube Co. at Oil City, Pa., resumed operations this week. The mills have been idle for more than a year.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:

The organization of the Perham-Stickney Co., Lowell, Mass., has been completed, capital, $1,000,000. The works are located at Atherton, suburb of Lowell, being formerly occupied by the Atherton Machine Co., for the manufacture of cotton machinery.

The Union Casting Co., Cincinnati, composed of local men, with W. H. Linton as manager, has leased the building at 618 West Fifth St. for making brass, aluminum, and composition castings. The company will eventually equip a machine shop to manufacture an article upon which patents are now pending.

The Wheeling Development Co. has purchased 150 acres near Norfolk, Va., and is reported as intending to build a large steel plant on the site. John T. Scott of Wheeling, W. Va., is president of the company, and George W. Dusch, also of Wheeling, is secretary and treasurer.

The New Era Machinery Co. has been incorporated at Denver, Col., with a capital of $50,000.

The Bovaird & Seyfang Co. of Bradford, Pa., manufacturers of boilers, engines, etc., will rebuild their shop at an early date.

The Haddock, Blanchard & Co., recently organized at Newark, N. J., was incorporated with capital stock of $300,000, to engage in the manufacture of iron, steel, etc.

The Southern Foundry & Machine Co. of Owensboro, Ky., recently organized with a capital of $40,000 is now building a new plant. The company is in the market for two 10-h. p. motors for alternating current, a cupola and other foundry equipment. The officers are L. Freeman Little, president; Louis D. Baer, vice-president; M. F. Bransford, secretary; Jas. H. Parrish, treasurer.

The Buhl Malleable Co. of Detroit, Mich., has increased its capital stock to $100,000. The company is now building an addition to its foundry to accommodate a continually increasing trade.

The Southwestern Equipment Co. of Baltimore, Md. has been incorporated under the laws of West Virginia with a capital of $100,000.

The Emerson Pump Co. has been incorporated at Alexandria, Va., with a capital of $500,000 and the following officers: Henry P. Woodward, president; Richard Young, vice-president; Chas. E. Wood, secretary, and Robert H. Graham, treasurer.

The George A. Ray Mfg. Co. of Buffalo, N. Y., has been incorporated with a capital of $300,000 to manufacture metal goods. G. A. Ray, W. B. Demarest and M. M. Drake are the incorporators.

The Thompson, Hoof Co. of Chicago, Ill., has been incorporated with a capital of $115,000 to manufacture products of iron and steel. William Thompson, John C. Hoof and Oscar F. Ridel are the incorporators.

The Fancher Machine Co. of Baldwinsville, N. Y., has been incorporated with a capital of $5,000 to manufacture machinery. R. I. Fancher, A. P. Clark and W. H. Tappan are the incorporators.

Graham Bros. Co. of New York, N. Y., has been incorporated with a capital of $25,000 to manufacture machinery. J. A. Graham, J. H. Graham and J. T. Graham are the incorporators.

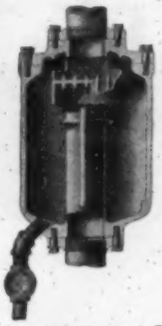
The Sturgess Governor Engineering Co. of Troy, N. Y., has been incorporated with a capital of $50,000, to manufacture turbine water wheel governors. The incorporators are John Sturgess, J. D. Ennis and E. R. Thomas.

The Great Western Stove Co. of Leavenworth, Kan., is putting in machinery for the purpose of making steel ranges.

Messrs. L. D. Price, N. Price and Louis E. N. Branson have incorporated the Price Machinery Co. at Chicago, Ill., to engage in the manufacture of general machinery.

The Anderson Tool Co. of Anderson, Ind., builder of electrically driven machine tools, has just been organized with a paid-up capital of $50,000. It will acquire the business of the Lea-Hooven Mfg. Co. and the Anderson Tool Co.

The Dawson Machinery Co. of Chicago has been incorporated with a capital of $35,000. The new concern will manu-



Section Through Centre. Vert. Form.

COCHRANE SEPARATORS.

There are several reasons, with which you are doubtless acquainted, why it is of advantage to insure dry steam to engines. Designers of new plants put "**Cochranes**" in the mains on account of the economy of working with steam containing practically no water, and to insure that no quantity of water will reach and damage the engines. Many a case of small piping and of bad piping can be cured by putting in a **Cochrane Separator.**

We have been building these appliances for quite a good many years and have had all sorts of knotty Separator problems presented for our consideration.

This experience is yours to command when you buy a "**Cochrane,**" and it is worth something, though the appliances themselves are worth the selling price.

Likewise, if you are interested in the question of how to take cylinder oil out of exhaust steam so that you can use this steam for heating by actual contact, or for boiler feed or other purposes when condensed, we would be glad to have the opportunity of telling you about our **Cochrane Oil Separators**—the results which they give being exceedingly satisfactory to their users. There are several thousands of these Oil Separators in present service.

HARRISON SAFETY BOILER WORKS,

Clearfield & 17th Sts., - - - - - - - - - - - - Philadelphia, Pa

facture machinery. John Dawson, J. H. Dawson and W. Herbertson are the incorporators.

At a recent meeting of the stockholders of the Wrightsville Hardware Co. of Wrightsville, Pa., it was decided to increase the capital stock from $25,000 to $100,000.

John W. Hall of East Liverpool, O., is negotiating with the citizens of Rogers, O., for a bonus for the erection of a fire brick plant.

The Railway Spring & Manufacturing Co. of Pittsburg, Pa., has been incorporated with a capital of $2,000.

The Illinois Central railroad will expend $100,000 for machinery to be installed in the machine shops of the company located at Waterloo, Ia.

The New Castle Sanitary Supply Co. of New Castle, Pa., has been organized with a capital of $200,000. The company will manufacture all kinds of sanitary supplies and specialties.

At a meeting of the creditors of the Continental Iron Co. held at Youngstown, O., last week it was decided to organize a company and operate the mill at Wheatland, Pa. The new company will be known as the Wheatland Iron & Steel Co. and will have a capital of $175,000. A committee was appointed at this meeting to proceed with the organization of the company and to call a meeting at a near date for the election of directors.

Fires and Accidents:—

The gas producer plant of the Pittsburg Steel Hoop Co. at Glassport, Pa., was practically destroyed by fire last week. The loss is estimated at $10,000.

With the exception of the foundry, the entire plant of the Kerr-Murray Machine Works, Fort Wayne, Ind., was destroyed by fire several days ago, causing a loss of $50,000. The new plant, which will include three buildings, 224x75 and a warehouse, 250x50, will be rebuilt at once.

Fire damaged the plant of the Kurtz Foundry Co., Chicago, Ill., to the extent of $25,000 last week. The plant of the Steel Ball Co. was also slightly damaged.

Furnace C of the Edgar Thomson plant of the Carnegie Steel Co. at Braddock, Pa., exploded last week and half dozen workmen were severely burned.

The foundry and machine shop of Gordon & Brown at Moundsville, Va., burned recently.

New Construction:—

The Kansas City, Fort Scott & Memphis railroad is enlarging its blacksmith shop at Springfield, Mo. New machinery will be installed.

The Spence-Baggs Stove Co. of Martin's Ferry, O., has awarded a contract for an additional plant. The company will add a new molding room. In other departments additions will also be made.

Plans have been prepared by the Cincinnati Screw & Tap Co. for the building of a one-story addition 50x170 feet to its screw department which will give an increased capacity to that department of about 35 per cent. The addition is to be completed about June 1. The company is in the market for screw making machinery.

The Hood Machine & Foundry Co. of Birmingham, Ala., is having plans prepared for a fireproof building to be used as a foundry and machine shop and equipped with cranes and other machinery.

The A. R. Dempster Co. of Des Moines, Ia., has purchased property adjoining its plant upon which a new foundry and machine shop will be erected.

The Hood Machine Co. of Birmingham, Ala., will erect a new building for its plant 150 feet long and 80 feet wide. The building will be two stories high and will cost approximately $25,000.

It is reported that the LaBelle Iron Co. of Wheeling, W. Va., will shortly erect a large plant at Steubenville, O. As soon as possible the nail mill located at Wheeling will be removed to Steubenville and all the plants of the company will probably be centralized about the Jefferson stack.

The W. H. Griffiths Co. of Washington, Pa., recently organized to build a tin plate plant at Waynesburg, Pa., has already placed orders for the necessary machinery, boilers,

The Robert Field Company,

20 Hayden Building, COLUMBUS, OHIO.

SELLING AGENTS FOR

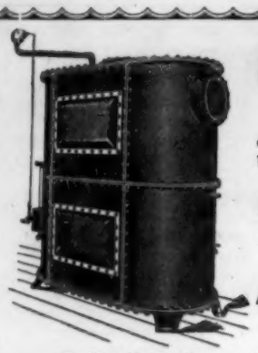
"SLOSS," "FLORENCE," "LADY ENSLEY" AND "SHEFFIELD" brands of Alabama Foundry and Forge Pig Iron.

"GLOBE" the best Jackson County Ohio Silvery Softener.

"Alexandria," "Preston" and "Bessemer" Connellsville Foundry Coke.

"CLIMAX" Kanawha Foundry Coke. Smithing Coal.

Western Office: ST. LOUIS, MO.



Feed-Water Heater.

FEED WATER HEATERS

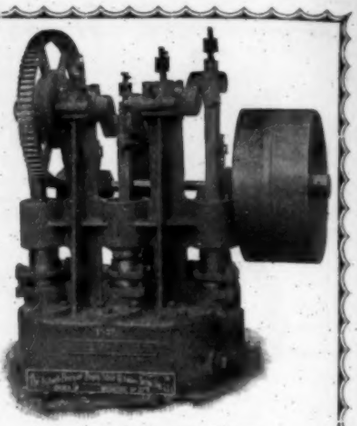
Cut herewith illustrates Stilwell's latest design. Made entirely of cast Iron. Saves fuel and filters the feed water for steam boilers. Use only exhaust steam.

BOILER FEED PUMPS

SINGLE, DUPLEX AND TRIPLEX.

AIR COMPRESSORS

JET-CONDENSERS-SURFACE



Triplex Boiler Feed Pump.

IF INTERESTED ADDRESS

The Stilwell-Bierce & Smith-Vaile Co., 227 Lehman Street, DAYTON, OHIO, U. S. A.

engines, etc. A six-mill plant will be erected and it is the intention to have three of the mills in operation by Sept. 1. The building for the hot mills will be 90x310 feet; the pickling department, 60x60 feet; the tin house, 80x75 feet, and the warehouse, 100x50 feet. The product of the plant will be coke and bright plates exclusively. The equipment, as far as it relates to machinery and power is the same as in the present mills of the Waynesburg Forge Sheet & Tin Plate Mills, at Waynesburg, Pa., and the Washington Charcoal Iron Tin Mills, at Washington, Pa. A contract has been made for the sale of the entire product of the new plant to be built at Waynesburg, extending over a period of three years. W. H. Griffiths, who is the active head of the new concern, is president of the Waynesburg Forge Sheet & Tin Plate Mills and the Washington Charcoal Iron Tin Mills, which have five tin mills at Washington, two tin and two sheet mills, with two more tin mills building at Waynesburg, and the six mills of the Griffiths Co. at Washington, making a total of 17 mills operated by the three concerns.

The Titusville Iron Co. of Titusville, Pa., will erect an addition to its plant for the forging of cranks, shafts and bolts.

The contract for the erection of the buildings of the Highland Iron & Steel Co. of Terre Haute, Ind., has already been let. Three of the buildings will be 224 feet long and 75 feet wide while the fourth will be 250 feet long and 50 feet wide.

The foundry capacity of the Golden Foundry & Machine Co. of Columbus, Ga., will shortly be increased 50 per cent by the erection of a large addition.

Gordon & Brown, whose machine shop and foundry at Moundsville, W. Va., was recently destroyed by fire will commence the erection of a new plant at once. The cost of the plant is estimated at $25,000.

The Fort Madison, (Iowa) Iron Works has increased its capacity by the erection of additional molding room.

The Bradshaw Pottery Co. and the Wiswell-Pritchard Electric Manufacturing Co. will locate at Niles, Ohio. They start at once to erect their respective plants, and when completed will jointly give work to 250 men.

The Meehan Boiler and Construction Co. of Lowellville, O., is completing an addition 100x100 feet. New machinery is being installed, including an angle bender and a punch from the Cleveland Punch & Shear Works Co. of Cleveland.

The Canadian General Electric Co. has purchased thirty acres of land at Toronto, Ont., as a site for a large foundry.

The Pittsburg District:—

The Star Tin Plate Works, at Etna and Twelfth streets, Pittsburg, idle for about six months, will resume operations on April 8 and give employment to between 500 and 600 men. The Star works are owned by the American Tin Plate Co., and the plant was the only idle one of that concern in the Pittsburg district.

The Carnegie Steel Co. is in receipt of an order from the Chilian government for 16,000 tons of standard steel rails to be delivered in 60 days.

It is rumored that the Pennsylvania Car Wheel Co. will pass under control of the Pressed Steel Car Co.

J. D. Lyon Co., merchant engineers, and exclusive agents of The Miller Improved Gas Engine Co. in the Pittsburg district, have removed from 347 Fifth Ave., Pittsburg, to 331 Fourth Ave.

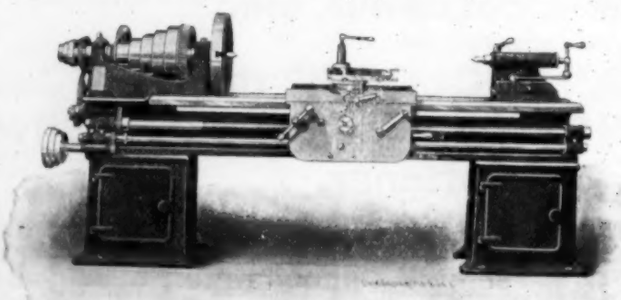
The Buffalo Forge Co. of Buffalo, N. Y., has opened an office in Pittsburg at 331 Fourth Ave., with R. B. Hayward as district sales agent.

The office of the Pittsburg Engineering Co. has been removed from 320 Fourth Ave. to 207 Lewis Building.

The McClintic-Marshall Construction Co. has signed the new scale of the structural iron workers of the Pittsburg district by which the latter secure an advance from 33 1-3 cents an hour to 40 cents an hour.

J. W. Rhodes & Co., Murtland Building, Pittsburg, have been appointed selling agents for the special high grade Globe

SCHUMACHER & BOYE,



ENGINE LATHES.

SEND FOR CATALOGUE D.

CINCINNATI, OHIO.

MOUNT SAVAGE FIRE BRICK.

UNION MINING CO.

ESTABLISHED 1841.
CAPACITY,
60,000 PER DAY; 18,000,000 PER YEAR.
The First Manufactory of Its Kind in the United States.

Proprietors of the
Celebrated
Mount Savage Fire Brick.
GOVERNMENT STANDARD.

Home Office and Works: MOUNT SAVAGE, Allegany County, Maryland.
Branch Offices: No. 1 Broadway, NEW YORK, N. Y.; Land Title Bldg., Broad & Chestnut Sts., PHILADELPHIA, PA.; Park Building, PITTSBURGH, PA.; Stowe, Fuller & Co., 249 Arcade, CLEVELAND, O.; N. A. Williams Co., 219 E. Washington St., CHICAGO, ILL.

OTIS STEEL

"OTIS" FIRE BOX PLATES A SPECIALTY.
Flange Plates, Ship Plates, Tank Plates, Steel Car Axles and Forgings of all Kinds.
Steel Castings from 100 to 75,000 lbs
Head Office and Works, CLEVELAND, OHIO.
Agencies: NEW YORK, 97 Cedar St.
ST. LOUIS, 615 N. Fourth St. WASHINGTON, Kellogg Bldg.
MONTREAL, Homer Taylor, 183 St. James St.
SAN FRANCISCO, John Woodlock, 154-156 First St.

JEROME KEELEY & CO.,
Established 1869. 421 Chestnut St., PHILADELPHIA
PIG IRON, IRON ORES AND COKE.
Consulting Engineers in Metallurgy and Mining. Steel and Iron Blooms, Muck Bar, etc

Advertisements that are studied, that are to the point and that are frequently changed, bring best results.

Pittsburg is becoming known as a banking and money center as well as a manufacturing point. Its Stock Exchange is the market for most of the iron and steel securities.

Robert C. Hall,
Member of the Pittsburg Stock Exchange,

will be pleased to secure information or make transactions in these stocks at any time. Phone 3613, or 331 Fourth Ave., PITTSBURG, PA.

silvery iron, made by the Globe Iron Co., of Jackson, O. The silicons in this iron run as high as 12 per cent.

J. R. Phillips, Pittsburg manager of the American Tin Plate Co., denies that the company contemplates the erection of a large plant at the present time in the Pittsburg district. He said further that he knew of no such plans in contemplation by the company.

The Braddock Machine & Mfg. Co. of Braddock, Pa., has commenced the manufacture of sand and chilled rolls. The company will make rolls on an extensive scale and already has a number of orders booked.

The corporate name of the Totten & Hogg Iron & Steel Foundry Co. of Pittsburg, will be changed to the George A. Hogg Iron & Steel Foundry Co. The output of this concern is sand and chilled rolls, rolling mill and tin plate machinery, mill engines, etc.

Chicago District and Northwest:—

W. A. Jones has bought the ground and foundry building 40x150 feet on the west side of Jefferson street, between Madison and Washington streets.

On Monday, March 25, the new plant of the Pressed Steel Car Co. at Joliet, Ill., succeeding the plant burned last December, commenced operations. The steel re-rolling plant of the American McKenna Process Co., idle since last November, also resumed at Joliet this week.

The Philip Meyer Foundry Co. of Sheboygan, Wis., is reported as intending to move to a more favorable location.

The Union Special Machine Co., Chicago, have outgrown their quarters and have bought for $52,500 the three-story and basement building, southwest corner Franklin and Michigan streets, a portion of which they now occupy.

The Reeves Pulley Co. has rented for their Chicago offices the large store rooms at 68 and 70 South Canal street, where their facilities will greatly surpass those they now possess in this city.

It is reported the National Steel Casting Co. of Montpelier, Ind., will build a 160-ft. addition to its foundry, and will install in it an electric crane and several new machines. It is also stated the company will build an additional acid bottom furnace, a 20-ton basic furnace and a 36-pot crucible furnace. These improvements when completed will cost in the neighborhood of $60,000 to $70,000.

The Kokomo Wire & Nail Co., Kokomo, Ind., will add a new rod mill to its present plant.

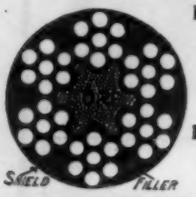
Kearney & Trecker of Milwaukee, Wis., are building a $6,000 machine shop at North Greenfield, Wis. Contracts for the engines and dynamos have not yet been let.

The Standard Pneumatic Tool Co., 1534 Marquette Building, Chicago, has increased its general offices by the addition of two suites of rooms connecting with the present offices. The company reports an increase of 50 per cent in its export sales since the first of the year over corresponding months last year, large shipments having been made to Italy, Spain, France and Germany.

The Chicago Pneumatic Tool Co., Monadnock Block, Chicago, will soon place on the market a new tank and bridge riveter, which will be known as the Duntley compression riveter. The company has recently issued a new catalogue, known as No. 12, on the cover of which, embossed in gold, are reproductions of the medals awarded it at the Paris Exposition. The catalogue contains a number of illustrations showing Chicago pneumatic tools in use on various kinds of work, also illustrations of the ship-building exhibit at the Paris Exposition, where pneumatic tools made by the Chicago Pneumatic Tool Co. were in use all the time.

The Robt. Aitchison Perforated Metal Co. of Chicago has closed a contract in the week which will require about 60 tons of sheet steel. From the present outlook 1901 will be the

E. R. ALLEN
MANUFACTURER OF
All kinds of soft, fine, medium and heavy Gray Iron Castings to order. Boiler, Heater and Architectural Iron Castings a specialty.
Send for Prices and Estimates.
Corning, New York.



Preserve your Wire Ropes, Manila Ropes, Leather Belts, Gearing.
Get Catalogue L.
Ironsides Paints for Roofs, Boiler Fronts, Stacks and all metal work.
THE IRONSIDES COMPANY,
Columbus, O., U. S. A.

A large and growing circulation among machine shop and foundry firms has
THE IRON TRADE REVIEW

Ore and Coal Handling Machinery
For Blast Furnaces, Docks and Mines,
MINING MACHINERY,
HIGH GRADE HOISTING ENGINES.
WEBSTER, CAMP & LANE MACHINE CO., Akron, Ohio.

Jonestoga Building, EDWARD E. ERIKSON, PITTSBURG, PA.
Regenerative Gas Furnaces and Water Seal Gas Producers.
Producer Gas under Tubular Boilers, saving 20 per cent in fuel. NO SMOKE.

FIRE BRICK.
BRANDS:
O. K. CROWN.
O. K.
A.
SUITABLE FOR
Furnace, Malleable, Mill, Foundry and Lime Kiln Work.
OAK HILL FIRE BRICK AND COAL CO.,
OAK HILL, OHIO.

PHOENIX HORSE SHOES—ARE THE BEST HORSE SHOES MADE
CATALOGUE SENT ON REQUEST.
PHOENIX HORSE SHOE CO., POUGHKEEPSIE, N. Y.—JOLIET, ILL.

The Champion Rivet Co.,
CLEVELAND, O., U. S. A.

Victor Boiler and Structural Rivets
FINISH UNEXCELLED. QUALITY HIGHEST STANDARD.
GOVERNMENT WORK A SPECIALTY.

KENTUCKY FIRE BRICK WORKS.
CUPOLA BRICK.

STEEL WORKS BRICK.
FIREBRICK, KY.

banner year with this company. With increased facilities, however, it expects to handle all business offered.

General Industrial Notes:—

The Hamilton Machine Tool Co. of Hamilton, O., last week shipped a carload of lathes and drill presses abroad for exhibition at the Glasgow, Scotland, Exposition.

It is reported that the Palmer Iron & Steel Co. of Muncie, Ind., is negotiating for the purchase from the American Tin Plate Co. of the bar mills located at the Muskegon plant of the combination at Muskegon, Mich., recently acquired.

At a meeting of the directors of the Falcon Bronze Co. held at Youngstown, O., last week the following officers were elected: Richard Garlick, president; John Tod, vice-president; G. A. Doeright, treasurer and manager; Joseph G. Swain, secretary and general sales agent.

The plant of the Youngstown Specialty Co., Youngstown, O., which was recently absorbed by the tin can combination resumed operations last week.

The puddlers employed by the Reading Iron Co. of Reading, Pa., last week received a voluntary increase in wages of 10 per cent.

The Alabama Steel & Shipbuilding Co. will likely increase its capital stock from $400,000 to $1,000,000.

The Monongahela plant of the Pittsburg Stove & Range Co., located at Monongahela, Pa., has been closed for an indefinite period. The plant is overstocked and operations will not be resumed until the surplus stock is disposed of.

The two stacks of the Lorain Steel Co. at Lorain, O., recently made 1,290 tons of iron in 24 hours. They were only designed for a capacity of 500 tons per day and the recent output is considered remarkable.

Arrangements have been completed for razing the North Mills of the Lackawanna Iron & Steel Co. at Scranton, Pa., and shipping the machinery in the plant to Buffalo, N. Y.

The Youngstown Iron Sheet & Tube Co. last week awarded the contracts for the erection of the buildings for its new plant to the American Bridge Co.

The E. W. Bliss Co. of Brooklyn, N. Y., owing to its greatly increasing European business, has found it necessary to open another branch office, at 15 Viale Monfort, Milano, Italy.

The Birmingham Machine & Foundry Co. of Birmingham, Ala., has received an order from Cuba for seven Corliss engines, to cost nearly $100,000.

The Cherookee Furnace at Cedartown, Ga., has resumed after making considerable improvements.

The business heretofore carried on by the Snowden-Cowman Mfg. Co. of Baltimore, Md., has been purchased by the Maryland Foundry & Machine Co. of that city, who will make a specialty of all kinds of patterns as well as machinery and repairs. Thomas P. Stran is president of the new company, while T. F. Wilhelm occupies the position of manager.

OUR COMMERCIAL TOURIST

REPRESENTING

The entire Ohio Valley product of MOLDING SAND Superior to any for wear and surface, and the largest body of Molding Sand under one control, together with 6,300 feet of railway siding, making an unlimited capacity.

MASTER VAN DYE

Molding Sand not equaled for Stove Plate, Hardware, Malleable or Grey Iron, light, medium, or heavy. Agricultural work, fine Brass and Core Sand, all of which are fully guaranteed as above.

Standard Molding Sand

IN USE FOR FIFTY YEARS

OUR Specialties are: No. 5 and No. 6 Newport, fine; No. 5 Indiana, strong and fine; No. 2 Indiana, red floor sand, and New Albany, medium fine. Having absolute control of every variety we represent, being 15 distinct and superior sands, we can satisfy the most skeptical user.

The Newport Sand Bank Co., NEWPORT, KY.

We own ALL of the FAMOUS NEWPORT SAND and are the ONLY SHIPPERS of same. The BILLING will show DECEPTION of IMITATORS.

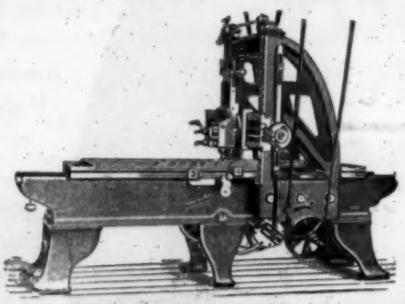
MACHINE TOOLS

TRADE MACHINERY MARK

LARGE STOCK FOR IMMEDIATE DELIVERY.

High Grade Labor Saving Machine Tools.

NEW AND SECOND HAND.



U·BAIRD MACHINERY CO.
123-125 WATER ST.
124-126 FIRST AVE.
PITTSBURGH
PENNA
U·S·A·

TRADE PAPER ADV. AGCY. N.Y.-E

Higley Cold Metal Saws AND Grinders

FOR MILLS, SHOPS, FOUNDRIES, RAILROAD, BRIDGE AND STRUCTURAL WORK

J. R. VANDYCK, Selling Agt.
136 LIBERTY ST., NEW YORK.

McDowell, Stocker & Co., Canal St., Chicago. Niles Tool Works, London, Eng. White, Child & Beney, Vienna, Austria. V. Lowener, Copenhagen, Denmark. W. P. Shipley, Philadelphia. Gustav Diechman & Sohn, Berlin, Germany.

Molders' Text Book.

Being Part II of American Foundry Practice, giving the best methods and rules for obtaining good castings, with detailed description for making molds. A thoroughly practical book that should be in the hands of every molder. By Thomas D. West. 460 pages, cloth..... $2.50

The Iron Trade Review Co.

...A B C OF IRON...

A book for foundrymen. It is issued in cloth binding, and gives much valuable matter on how to reduce cost of mixtures, and on grading and numbering of pig iron.

CHAPTER HEADINGS:—Iron—What is it? Pig Iron. Constituents of Iron. Numbering of Pig Iron. Grading of Iron. How to reduce cost of mixture. Steel, Physical Properties of Metals Defined. Statistics. Early History and Manufacture of Iron.

Former Price, $2.00. NOW $1.00.

Sent, postpaid, on receipt of price, by

THE IRON TRADE REVIEW CO.,

CHICAGO. CLEVELAND PITTSBURG

WRITE FOR CATALOG

The Lunkenheimer Regrinding Valves Made of Gun Metal

are unsurpassed where thorough, reliable service is the first requisite. In screw and flange ends for 200 and 350 lbs. working pressure, ⅛ to 4 inches . . . . . A trial order demonstrates their peculiar fitness and invariably results in their adoption. These valves are extensively used and in continuous service on war vessels of the United States Navy, locomotives, lake and river boats, factories, mills, power plants, etc. Specify LUNKENHEIMER make and order from your dealer.

The Lunkenheimer Co., Sole Makers and Patentees CINCINNATI, OHIO, U. S. A.

BRANCHES: New York, 26 Cortlandt St. London, 85 Great Dover St., S. E.

IT PAYS TO ADVERTISE IN THE IRON TRADE REVIEW.

When writing to advertisers please mention The Iron Trade Review.

Our Customers Prefer It.

Wisconsin Graphite Paint

Excels other kinds in

Durability,
Length of Life,
Permanency of Color,
Covers More Surface.

And the cost—well, let us send sample and prices, they will surprise you.

Wisconsin Graphite Company,
413 Market St., Pittsburg, Pa.

The EDWARD P. ALLIS Co.
MILWAUKEE WIS. BUILDERS
REYNOLDS CORLISS ENGINES

BLOWING ENGINES – HOISTING ENGINES – PUMPING ENGINES
SPECIAL ENGINES FOR ELECTRIC LIGHTING – STREET RAILWAYS AND ROLLING MILLS
SAW MILL, FLOUR MILL AND MINING MACHINERY

Southwark Foundry & Machine Co.
PHILADELPHIA PA.
Porter-Allen Automatic Engines,
Blowing Engines, Centrifugal Pumps,
Weiss Counter-Current Condensers.

Cleveland, Lorain & Wheeling,

Railroad Company.

TIME SCHEDULE.

Southbound, (down). (up). Northbound.
January, 1901.

15	13	11	Lorain Branch	10	14	16
P.M.	P.M.	A.M.		P.M.	A.M.	P.M.
4:00	1:05	7:00	Lorain	3:32	12:02	7:15
4:18	1:25	7:20	Elyria.....	3:14	11:45	6:59
4:36	1:53	7:43	Grafton	2:56	11:29	6:41
4:58	2:15	8:05	Lester Jun...	2:32	11:08	6:21

5	3	1	Main Line.	2	4	6
P.M.	P.M.	A.M.		A.M.	A.M.	P.M.
5:10	1:35	7:50	Cleveland.....	9:50	12:00	6:00
6:20	2:31	8:27	Lester Jun...	8:48	11:07	5:00
6:31	2:40	8:36	Medina	8:36	10:59	4:48
6:54	2:59	8:57	Seville	8:14	10:40	4:26
7:00	3:04	9:03	Sterling	8:03	10:34	4:20
7:22	3:24	9:24	Warwick.....	7:41	10:13	3:56
7:30	3:32	9:31	Canal Fult'n	7:34	10:06	3:48
7:50	3:50	9:50	Ar. Dep. Massillon.	7:15 8 P.M.	9:50	3:30
7:50	3:50	9:50	Dep. Ar.	7:50	9:50	3:30
8:05	4:06	10:05	Justus.....	7:34	9:35	3:13
8:35	4:37	10:36	Canal Dover	7:03	9:05	2:44
8:43	4:44	10:43	New Phila....	6:55	8:58	2:37
9:00	5:01	11:00	Ar. Dep Urichsville	6:38	8:40	2:20
7 A.M.						
7:30	5:10	11:10	Dep. Ar	6:38	8:40	2:20
8:06	5:43	11:42	Freeport	6:00	8:06	1:44
		P.M.				
8:32	6:07	12:05	Flushing	5:34	7:42	1:20
9:40	7:05	1:05	Bridgeport...	4:30	6:45	12:20

All of above trains daily except Sundays.
Sunday train leaves Urichsville 6:10 a.m., arrives Cleveland, 9:50 a. m.
Sunday train leaves Cleveland 6 p. m., arrives Urichsville 9:35 p. m.
Electric cars between Bridgeport, Bellaire Martins Ferry and Wheeling.

M. G. CARREL, General Passenger Agent.

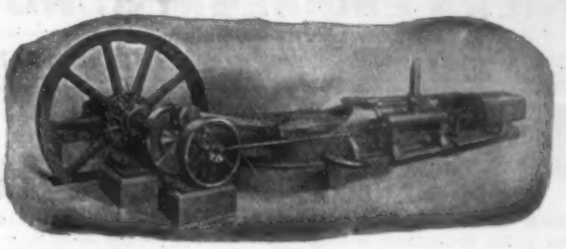
Subscribe for

THE IRON TRADE REVIEW.

The William Tod Co.

YOUNGSTOWN, OHIO.

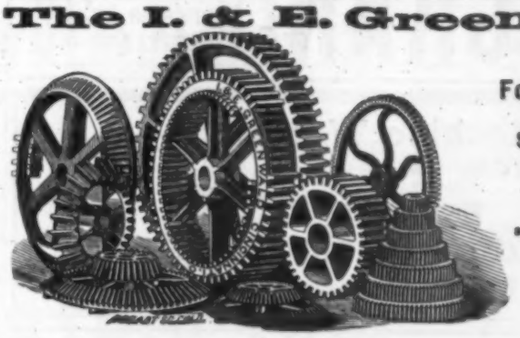
The PORTER-HAMILTON ENGINE.



Reversing Engines, Blowing Engines, Converters, Hydraulic and special heavy machinery for the iron and steel trades.

PARK BUILDING, PITTSBURG, - - Seward S. Babbitt.

The I. & E. Greenwald Co.



Engineers,
Founders and Machinists.

Steam Engines, Shafting, Hangers, Pulleys, Sprockets Wheels, Chains, Etc., Etc.

Headquarters for Mill Gearing of all kind and sizes.
Steam Power Plants complete.

720 East Pearl Street.,
CINCINNATI, O.

The Geo. B. Sennett Co., Youngstown, Ohio

MANUFACTURERS OF

Sennett Compression Coupling

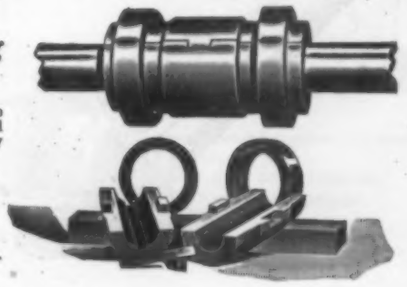
And Other Specialties.

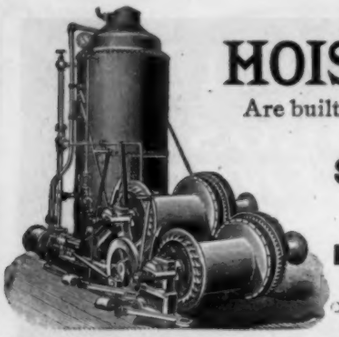
We do not claim novelty in these Couplings so much as good material, good workmanship and extreme simplicity. We make them of a very strong cast iron, with wrought iron bands.
We make also the

SENNETT ENGINE

20 to 40 H. P.

Foundry contracts solicited for duplicate castings, from 10 lbs. to 5 tons each.

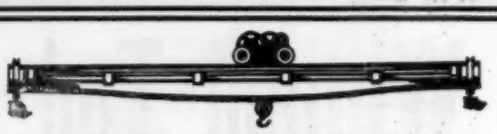




LIDGERWOOD
HOISTING ENGINES
Are built to Gauge on the Duplicate Part System.
QUICK DELIVERY ASSURED.
STANDARD For Quality and Duty.
17,500 IN USE.
Steam and Electric Hoists.
LIDGERWOOD MFG. CO.,
96 LIBERTY STREET, NEW YORK.
Chicago, Cleveland, Boston, Pittsburg, Atlanta, Philadelphia, Portland, Ore. New Orleans.

Malleable Iron Buckets of Approved Pattern and Weight.

LINK-BELT Elevators and Conveyors.
for handling Slabs, Billets, Bar Iron, Coal, Ashes, Cement, etc. Shafting, Pulleys, Patent Machine-moulded Rope Sheaves, Clutches, etc.
LINK-BELT MACHINERY CO.,
ENGINEERS, FOUNDERS, MACHINISTS.
Chicago, U. S. A.
LINK BELT ENGINEERING CO., PHILADELPHIA and NEW YORK.

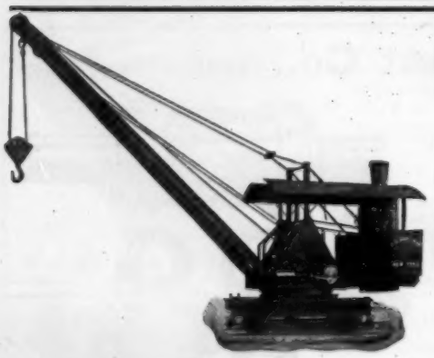


CRANES.
High Grade Electric Traveling Cranes. Modern, Simple, Practical.
Also Hand and Pneumatic Cranes.
NORTHERN ENGINEERING WORKS
No. 6 CHENE STREET,
(Cleveland Office: C. E. STAMP & CO. New England Bldg.) DETROIT, MICH.

CRANES • HIGH • SPEEDS • ELECTRIC • STEAM • HAND • MACHINERY FOR HANDLING COAL AND ORE
THE BROWN HOISTING MACHINERY CO. Works, Cleveland, O.
NEW YORK, 26 Cortlandt Street. LONDON, 39 Victoria Street, S. W.

THE CLEVELAND CRANES OF ALL KINDS FOR ALL PURPOSES CRANE AND CAR CO SUPERIOR ST. CLEVELAND O.

The Exeter Machine Works,
PITTSTON, PA.
Manufacturers of
High Grade Hoisting Engines
ELEVATING AND CONVEYING MACHINERY.



Locomotive Cranes
IN CAPACITIES
Three to Fifty Tons
INDUSTRIAL WORKS
BAY CITY
MICH.

Steel Works and Rolling Mill Engineers.

Carrett-Cromwell Engineering Co.,
New England Building,
CLEVELAND, OHIO.

Good Books to Have

Metallurgy of Cast Iron	$3 00
Encyclopaedia of Foundry Terms .	3 00
A. B. C. of Iron	1 00
Cupola Furnace	3 50
Metcalfe on Steel	2 00
Turner's Metallurgy of Iron . . .	5 00
Blair's Chemical Analysis of Iron .	4 00
West's Molders Text Book . . .	2 50
Bolland's Iron Founders Supplem't	2 50

We can furnish any of them.

THE IRON TRADE REVIEW,
CLEVELAND CHICAGO PITTSBURG

The Monthly Official Railway List.

Is the oldest, largest, most complete, and by far the most widely circulated publication of its kind in the world.

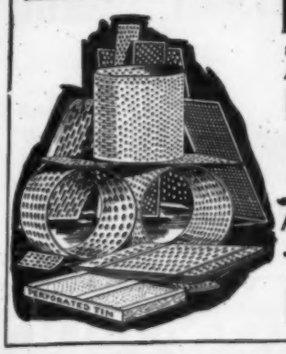
A complete Directory of the Steam Railways of North America and their Officials and Sub-Officials.

The April issue of the **"RED" LIST** is now out. If you are a railroad official, you should have received your copy; if you have not, write us for it at once.

THE OFFICIAL RAILWAY LIST,
315 Dearborn St., Chicago.

Buy your advertising as you do other material—by comparing prices and quality. Compare the "Thirty-Day" List with any other similar publication as regards accuracy and completeness.

DO YOU USE **PERFORATED**



ZINC, COPPER, BRASS IRON, STEEL OR ANY PERFORATED METAL?

AITCHISON MAKES 600 VARIETIES.

THE ROBERT AITCHISON PERFORATED METAL CO. 303-305 DEARBORN ST., CHICAGO, ILL.

PERFORATED PLATE SCREENS AS REQUIRED FOR STONE, ORE, ZINC, LEAD, and all Railroad and Mining Uses. Special Screens for COAL and COKE.

THE HENDRICK MFG. CO., LTD., Carbondale, Pa.

Samples and information upon request.

SCIENTIFIC MFG. CO., The Rookery, CHICAGO.

COMMERCIAL DECALCOMANIAS

JULIAN KENNEDY, Engineer.

Cable Address "ENGINEER PITTSBURG."

PITTSBURG, PA. U. S. A.

The Wellman-Seaver Engineering Co.,

CONSULTING AND CONTRACTING ENGINEERS.

NEW ENGLAND BLDG., CLEVELAND, OHIO, U. S. A.

Steel Works, Rolling Mills, Metallurgical Furnaces, Manufacturing Buildings, Machinery for the most economical handling of all kinds of material.

CABLE ADDRESS "WELLSEA" CLEVELAND.

Sole manufacturers of FORTER WATER SEALED REVERSING VALVES and FRASER-TALBOT MECHANICAL GAS PRODUCERS.

LONDON OFFICE: 47 VICTORIA STREET, WESTMINSTER.

STEEL CONSTRUCTION in All Branches

BUILDINGS DESIGNED AND ERECTED in all parts of the world

ROOF FRAMES AND TRUSSES
CUPOLAS, LADLES, CONVERTERS
BLAST FURNACES AND STEEL WORKS
BOILERS, TANKS, AND HEAVY PLATE WORK

RITER-CONLEY MFG. CO., PITTSBURG, PA.

Blast Furnaces Constructed with Automatic Filling Apparatus

Require no Top Fillers.

WALTER KENNEDY, ENGINEER,

611 Penn Ave., PITTSBURG, PA.

United Boiler Co.

GIRARD, OHIO.

Tanks, Boilers, Stills, Blast Furnaces, Heaters, etc., etc.

BOILER MAKING IN ALL ITS BRANCHES.

Repairs Promptly Attended to. Long Distance Telephone. Send for Estimates.

Alex Laughlin & Co.,

Engineers and Contractors.

702-706 Lewis Block, PITTSBURG, PA.

DAVID LAMOND,

Contracting Engineer,

Ferguson Block, · PITTSBURG, PA.

Blast Furnace Construction.

Agent for C. H. Foote Patent 3 and 4 Pass Fire Brick Stove.

The Iron Founder Supplement.

A complete illustrated exposition of the art of casting in iron, comprising the erection and management of cupolas, reverberatory furnaces, blowers, dams, ladles, etc., mixing cast iron, founding of chilled car wheels, malleable iron castings, foundry equipments and appliances, gear molding machines, molding machines, burning, chilling, softening, annealing, pouring and feeding, foundry materials, advanced molding, measurement of castings wrought iron, steel, etc. Also the founding of statues, the art of taking casts, pattern modeling, useful formulas and tables. By SIMPSON BOLLAND. Illustrated with over 200 engravings; 400 pages; 12mo; cloth $2.50

Sent postpaid on receipt of price by

The Iron Trade Review Co.,

CHICAGO. CLEVELAND. PITTSBURG

When writing to advertisers, kindly mention this paper.

THE GRASSELLI CHEMICAL CO.

Cleveland, O.

MANUFACTURERS OF

STRICTLY CHEMICALLY PURE

Sulphuric Acid,
Hydrochloric Acid,
Nitric Acid,
Aqua Ammonia.

CRUCIBLE CAST TOOL STEEL.
LA BELLE STEEL CO., PITTSBURG.

"ECLIPSE" COLD DRAWN SHAFTING.
FITZSIMONS & CO., CLEVELAND.

COLD ROLLED STRIP STEEL.
MORRIS & BAILEY STEEL CO., PITTSBURG.

BYRON H. WHITE, WESTERN SELLING AGENT.
68-70 SOUTH CANAL STREET, CHICAGO.

STEAM HAMMERS
DOUBLE STAND.

Made Especially for Hammering TOOL STEEL.
Sizes from 400 to 3,000 pounds.
Fitted with our Improved Piston Valve.

Samuel Trethewey & Co., Ltd.,
PITTSBURG, PA.

CRESCENT STEEL
ESTABLISHED 1836 — INCORPORATED 1888.
CRESCENT STEEL CO.
480 PEARL ST. NEW YORK — PITTSBURGH, PA. — 64 & 66 S. CLINTON ST. CHICAGO.

THE MASSILLON IRON AND STEEL CO.
CAST IRON PIPE FOR WATER, GAS & CULVERTS
FLANGE PIPE & FITTINGS A SPECIALTY.
THE ROOKERY. CHICAGO, ILL.
CAST IRON PIPE.
ENGINEERS FOUNDERS-MACHINISTS.
HEAVY CASTINGS IN LOAM-GREEN SAND OR DRY SAND FOR BLAST FURNACES ROLLING MILLS, ETC
WORKS & OFFICE MASSILLON, O.

Le Chatelier's
PYROMETER
For measuring temperatures between 0 and 2,900° F.
Recommended by the Highest Authorities.
Successfully used in establishments for the manufacture of

Gas,	Chamotte,
Chemicals,	Cement,
Sugar,	Accumulators,
Terra Cotta,	Incandescent Lamps,
Stone Ware,	Cartridges and Ammunition.
Porcelain,	Glass,

Iron and Steel, Malleable Iron.
Also by Boiler Inspectors, Schools and Colleges, for hardening and annealing steel in roll foundries, etc.
VULCAN MFG. CO., Ltd.,
Pittsburg, Pa.
Station A.

ECONOMIC WATER SUPPLY

THE WORLD'S BEST AUTOMATIC PUMP
TRIPLEX POWER PUMPS
FOR GAS ENGINE OR ELECTRIC MOTOR
PUMPS FOR ALL PURPOSES
THE DEMING CO.
MANUFACTURERS
SALEM - - - OHIO
HENION & HUBBELL
GENERAL AGENTS FOR CHICAGO
61-63 North Jefferson St. CHICAGO

Larger paid circulation and larger list of advertising patrons than ever in its history. These THE IRON TRADE REVIEW now has. Advertising in it pays.

Tropenas Department

Steel Castings,
25 LBS. AND UNDER.
Estimates given on not less than 100 from each pattern.

THE SARGENT CO.,
687 Old Colony Bldg., CHICAGO.

MONONGAHELA IRON & STEEL CO.,
Manufacturers of
Charcoal Bar Iron **CARTER BRANDS** Charcoal Iron Chain
All Sizes
United States Government Specifications Guaranteed.
PITTSBURGH, PA.

The Iron Trade Review
Pays special attention iron ore, blast furnaces rolling mill, foundry and machine shop interests.
Per year $3.00.

IRON and STEEL CONSOLIDATIONS.

—

Second Edition of Supplement to the DIRECTORY OF THE IRON AND STEEL WORKS OF THE UNITED STATES FOR 1898.

From the circular of the Association, issued under date of Sept. 15 we take the following:

"In March last we presented to the American Iron Trade a descriptive list of the consolidations of iron and steel companies which had taken place in the United States since January 1, 1898, twenty-three in all. We now present to the trade a more complete list of iron and steel consolidations, embracing those organized since March as well as those previously described, *numbering thirty in all*, the information relating to each consolidated company being revised and verified down to August 15. We have confined the list of consolidations to those which embrace the ownership of blast furnaces, rolling mills, steel works, tinplate works, and auxiliary industries, including shipbuilding and bridgebuilding works. Only companies that have been consolidated since January 1, 1898, are described in this volume, which is a Supplement to the last edition of our Directory to the Iron and Steel Works of the United States. *A new edition of the Directory cannot be printed this year.*

"The present edition of the Supplement comprises 78 well printed pages and contains an authorized description of the organization of each of the thirty consolidations mentioned, giving its capitalization, list of officers, general office address and address in most instances of the district offices, and a list of properties owned or operated by it, with the names of previous owners of iron and steel works. The name and the character of every plant are fully stated. For detailed information concerning the plants mentioned and their products reference is given to the page or pages in the Directory in which they are fully described. Iron ore mines, coal mines, coke ovens, railroads, and lake vessels owned by the consolidated companies are also given in sufficient detail."

Price - - $2.00

Sent Postpaid by

The Iron Trade Review Co.,

CAXTON BUILDING, CLEVELAND, O.

Steam Piping for High Pressure Power Plants.

ALL KINDS OF PIPE, GLOBE AND GATE VALVES, FITTINGS AND APPLIANCES FOR STEAM, WATER AND HYDRAULIC WORK.

Pittsburgh Valve, Foundry & Construction Company,

Offices: Empire Building, PITTSBURGH, PA.

ENGINEERS, FOUNDERS, PIPE FITTERS AND MACHINISTS.

Henry M. Atwood, President. C. A. Anderson, Treasurer.
J. T. Speer, Vice-President. Moses Atwood, Secretary and Sales Agent.
Geo. E. Klingelhofer, General Manager.

The Vulcanus Forging Co.,

CLEVELAND, O.

RAILROAD AND SPECIAL FORGINGS

Telephone Forgings, Air Brake Pins,
Bolts and Rivets, Lag Screws,
Special Nuts.

Have your rods upset and save 25 per cent of material.

RAWHIDE BELTING.

And Lace Leather.

—— ALSO ——

Rawhide Rope, Pinions, Picker Leather, Halters, Bell and Register Cord, and other Rawhide Goods of all kinds.

THE MABBS HYDRAULIC RAWHIDE PACKING.

CHICAGO RAWHIDE MFG. CO., 75-77 Ohio Street, CHICAGO, ILL.

The A B C of Iron.

Is issued in cloth binding, and gives much valuable matter on how to reduce cost of mixtures, and on grading and numbering of pig iron. CHAPTER HEADINGS:—Iron—What is it? Pig Iron. constituents of Iron. Numbering of Pig Iron. Grading of Iron. How to Reduce Cost of Mixture. Steel. Physical Properties of Metals Defined. Statistics. Early History and Manufacture of Iron. Former price $2.00, NOW $1.00. Order of *The Iron Trade Review Co.*, 27 Vincent St., Cleveland O.

BEST MANUFACTURING CO., Pittsburg, Pa.

Brass and Iron Founders,

Pipe Fitters and Machinists,

Manufacturers of **Best Gate Valves** For High and Low Pressure.

Millett's Patent Portable **CORE OVEN**

All complete and ready to put the fire in.

No one who makes small cores can afford to be without it.

Double Doors, One closing the oven when the other is open. . . . .

SAVES FUEL. SAVES TIME.

Send for Circular.

MILLETT CORE OVEN CO., Brightwood, Mass.

Drake's Adjustable Burner

Can be turned down from a full size flame to one candle power by means of the little valves, one of which may be closed entirely and the other one reduced to a flame as small as desired for a night light without smoking, carbonizing or producing a sluggish flame.

The diverging stems are so arranged that they can be turned into alignment in an instant.

The points of the little valves may be forced up through the little hole where the gas is liberated from the rear, removing any obstruction without being obliged to extinguish the whole flame.

Patents pending in the United States, Canada and Principal Countries of Europe.

Manufactured and For Sale only by the

DRAKE ACETYLENE APPARATUS CO.,

Or Its Agents,

32 Hathaway St., CLEVELAND, O., U. S. A.

C & B LINE

Pan-American Route

Between **CLEVELAND** and **BUFFALO.**

STEAMERS CITY OF BUFFALO AND CITY OF ERIE.

Both together being without doubt, in all respects, the finest and fastest that are run in the interest of the traveling public in the United States.

TIME CARD—DAILY—APRIL 15th to DEC. 1st.

Leave Cleveland 8 p. m. Arrive Buffalo 6:30 a. m. | Leave Buffalo 8 p. m. Arrive Cleveland 6:30 a. m.

ADDITIONAL SERVICE DURING JULY AND AUGUST DAILY EXCEPT SUNDAY.

Leave Cleveland.....8:00 a. m. | Leave Buffalo.....8:00 a. m.
Arrive Buffalo.....6:00 p. m. | Arrive Cleveland.....6:00 p. m.
Leave Cleveland Tuesdays, Thursdays and Saturdays 5 p. m. Arrive Buffalo 5:30 a. m.
Leave Buffalo Mondays, Wednesdays and Fridays 5 p. m. Arrive Cleveland 5:30 a. m.

All Central Standard Time. Orchestra Accompanies Each Steamer.

Connections made at Buffalo with trains for all Eastern and Canadian points, at Cleveland for Detroit and all points West and Southwest.

Ask ticket agents for tickets via C. & B. Line. Send four cents for illustrated pamphlet. SPECIAL LOW RATES CLEVELAND TO BUFFALO AND NIAGARA FALLS EVERY SATURDAY NIGHT, ALSO BUFFALO TO CLEVELAND.

W. F. HERMAN, General Passenger Agent, Cleveland, O.

If You Don't See

the book you want advertised in the columns

of the paper write us and will we get it for you.

The Iron Trade Review, Cleveland, Chicago, Pittsburg

Send for Price-list No. 12.

QUICK WORK GOOD WORK!

Elastic Rotary-Blow Riveting Machine.

Strikes 3,000 blows per minute. For riveting hardware, bicycle chains, agricultural implements, mechanic tools, etc.

Manufactured by

F.B. SHUSTER CO.

NEW HAVEN, CONN.

TRADE PAPER ADV. AGENCY, N.Y.

THE

DAILY METAL MARKET REPORT

Published by

THE REPORT CO.,

Room 79, 99 John St., New York.

Gives daily reports of foreign and domestic metal markets. Shows daily fluctuations in all metals, both in this country and in Europe. Contains the latest news affecting the market for Pig Iron, Steel, etc. Write for sample copy. We guarantee a circulation greater than the combined circulation of all competitors. As an advertising medium for reaching the Iron, Steel and Metal producers and consumers it has no superior.

A firm needing a certain line of goods naturally turns first to those it has seen oftenest advertised, and with whose name it thus has become familiar. "Keeping everlastingly at it brings success."

Water, Gas and Steam Fitters' Tools.

No. O Threading Machine. Power Attachment.

"ARMSTRONG"

ADJUSTABLE STOCKS AND DIES,

Vises (hinged), Improved Wrenches, Pipe Cutters, Clamp Dogs, Etc.

Improved Pipe Threading and Cutting-off Machines,

HAND OR POWER.

Our No. O machine is designed for threading the smaller sizes of pipe—iron or brass—also bolts. Has two speeds: one for pipe ⅛ to 1 in., the other for pipe 1¼ to 2 in. inclusive.

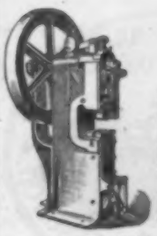
The Armstrong Mfg. Co.,

BRIDGEPORT, CONN.

☞Our catalogue will interest you

New York Office, 139 Center St.

Metal Working Machinery



RIVETERS, POWER PRESSES, ROTARY SHEARS, BENDING MACHINES.

SEND FOR CATALOG.

Bethlehem Foundry & Machine Works,

SOUTH BETHLEHEM, PA.

FORBES PATENT DIE STOCK

and one man can with ease cut off and thread 12 inch pipe.
Smaller sizes proportionately easy.

Send for Catalogue.

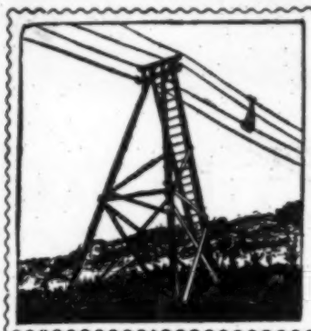
THE CURTIS & CURTIS CO.,

137 Garden St., - - BRIDGEPORT, CONN.

The Elastic Nut Track-Bolt

makes the best and cheapest rail-fastening. NUTS NEVER WORK LOOSE. Requires no nut-lock. Our Elastic Self-Locking Steel Nut always stays, and is superior for use on Cars, Track, Bridges, Machinery etc. Write us for prices on Sq. and Hex. Nuts, (Elastic or Common) Machine Bolts, Track Bolts, Rivets, etc.

NATIONAL ELASTIC NUT CO.,
MILWAUKEE, WIS.



Leschen Co.'s Patent Aerial

WIRE ROPE **TRAMWAY**

ALSO

WIRE ROPE For Hoisting, Haulage, Transmission, etc.

Manila and Sisal Rope and Blocks.

A. LESCHEN & SON ROPE COMPANY,

920-922 N. First St., ST. LOUIS, MO.
92 Center St., NEW YORK, N. Y.
47-49 South Canal St., CHICAGO, ILL.

Machinery For Reducing and Pointing Wire By Compression or Cold Swaging.

Especially adapted to Pointing Wire Rods and Wire for Drawing. For machines or information, address

S. W. GOODYEAR,
Waterbury, Conn.

DETROIT

Emery-Corundum WHEELS,

Wm. Sellers & Co.'s Tool and Twist Drill Grinders.

J. WENDELL COLE,
District Manager,

P. O. Box 84, COLUMBUS, OHIO.
P. O. Box No. 486, CHICAGO, ILL.

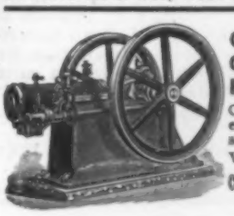
COVERT MFG. CO.,
West Troy, N. Y.

"Yankee" Snaps

Made in Styles and Sizes.

For Sale by Jobbers at Manfrs. Prices.

COVERT MFG. CO., West Troy, N.Y., U.S.A.



GAS AND GASOLINE ENGINES.

Cheap and convenient power for any service.

Write for catalogue

COLUMBUS MACHINE CO.
COLUMBUS, O.

Persistence in Advertising

In the expansion of business now bringing profit to so many manufacturers, advertisers who have made themselves regularly prominent in the past five years have been notable in reaping the rewards of persistent publicity.

The Cleveland Terminal & Valley R. R. Co

(B. & O. System.)

Depot foot of So. Water St. City Office 241 Superior St.	Arrive.	Depart.
Valley Jctn. & Way Stations..	*6:20 P M	*7:15 A M
Wheeling & Chicago.....	*9:25 P M	†7:15 A M
Akron, Canton & Chicago.....	*8:10 A M	*9:35 P M
Akron, Canton & Wheeling...	*10:00 A M	*3:25 P M
Akron, Canton & Chicago.....	*8:10 A M	*6:35 P M
Akron, Canton & Marietta,...	†2:10 P M	†11:00 A M
Pittsburg, Washington, D. C., & Baltimore.....	*10:45 A M	*3:10 P M

†Daily except Sunday. *Daily. Pullman's Palace Vestibule sleeping cars between Cleveland and Chicago, also Washington, Baltimore and Philadelphia.

M. ALLEN, President.

WM. B. FRANKLIN, Vice-President.

F. B. ALLEN, Second Vice-President.

J. B. PIERCE, Secretary and Treas.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN.

BURWELL & BRIGGS, General Agents, 32 and 33 Clark Bldg., 208 Superior St., Cleveland, O.

C. A. BURWELL, Chief Inspector, 32 and 33 Clark Bldg., 208 Superior St., Cleveland, O.

J. E. WOLCOTT, Special Agent, 32 and 33 Clark Bldg., 208 Superior St., Cleveland, O.

Locations for Industries.

The name of the Chicago, Milwaukee & St. Paul Railway has long been identified with practical measures for the general upbuilding of its territory and the promotion of its commerce, hence manufacturers have an assurance that they will find themselves at home on the company's lines.

The Chicago, Milwaukee & St. Paul Railway Company's 6,300 miles of railway, exclusive of second track, connecting track or sidings, traverses eight states, namely:

NORTH DAKOTA	MINNESOTA	NORTHERN MICHIGAN
SOUTH DAKOTA	IOWA	WISCONSIN
Express Passenger Trains Fast Freight Trains Throughout	MISSOURI	ILLINOIS

which comprise a great Agricultural, Manufacturing and Mining territory.

The Chicago, Milwaukee & St. Paul Railway Company gives unremitting attention to the development of local traffic on its lines and, with this in view, seeks to increase the number of manufacturing plants on its system either through their creation by local enterprise or the influx of manufacturers from the East. It has all its territory districted in relation to resources, adaptability and advantages for manufacturing. Specific information furnished manufacturers in regard to suitable locations. Address,

LUIS JACKSON,
Industrial Commissioner, C. M. & St. P. R'y.
Old Colony Building, Chicago, Ill.

Persistence In Advertising

Is one of the requisites of satisfactory results. In the expansion of business which is now noticeable in every section of the country, advertisers who have made themselves regularly prominent in the past two years will be first to reap the rewards of persistent publicity.

FOR GREAT TENSILE STRENGTH, ELASTICITY AND ELONGATION, COUPLED WITH UNUSUAL NON-CORROSIVE QUALITIES.

Castings and Propeller Wheels

Made from

PARSONS MANGANESE BRONZE

Cannot be excelled. Write for Particulars.

SOLE MAKERS

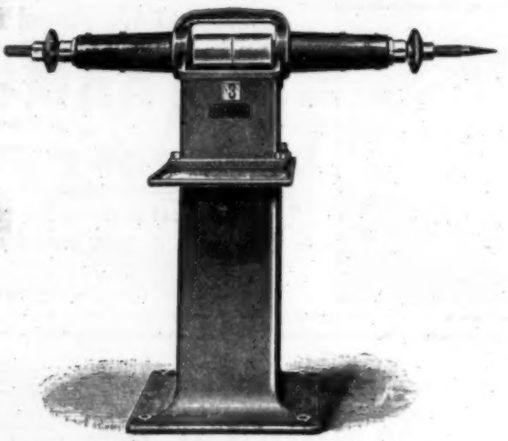
THE WILLIAM CRAMP & SONS'

Ship and Engine Building Company,

PHILADELPHIA, PA.

Northampton Emery Wheel Co.,

20 S. Canal St., CHICAGO, ILL.



BUFFER No. 3.

Length of arbor over all, 52 inches. Length between flanges, 40 inches. Diameter of arbor through bearings, ¾ inch. Diameter through collars, 1 inch or 1¼ inch. Pulleys, 4 inch x 4 inch. Height from floor to center of arbor, 39 inches

COMPLETE CATALOGUE ON APPLICATION.

Who builds the best Mine Pump?

PRESCOTT.

Fred. M. Prescott Steam Pump Co.,

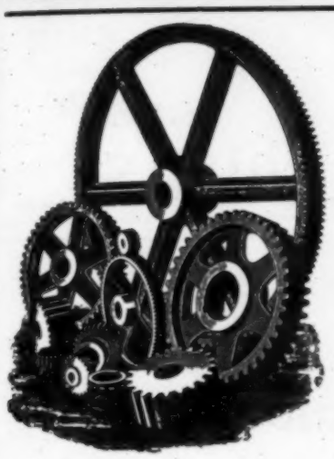
MILWAUKEE, WIS.

The Iron Trade Review is an increasingly valuable medium, through which to sell equipment to machine shop and foundries.

YOU CAN DECREASE

expenses by equipping your machines with Cut or Planed Gearing. Cut or Planed Gears operate with practically half the power required for Cast Gears. We can furnish Cut or Planed Spur, Bevel and Mitre Gears for all classes of machines. Estimates made from Blue Prints or Specifications.

R. D. NUTTALL COMPANY,
PITTSBURG, PA.



THE VAN DORN & DUTTON CO.
CLEVELAND, OHIO.
General Machinists and Engineers.

GEAR CUTTING of all descriptions.

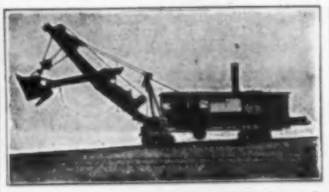
WE MAKE GEARS of Steel, Malleable Iron, Cast Iron, Brass and Rawhide.

Bevel Gears Planed Theoretically Correct by Latest Design Machines.

GEAR CUTTING.
Spur Gears,
Bevel and Mitre Gears,
Worm Gears,
Spiral Gears,
Internal Gears.
¼ to 50 inches diameter.
48 Diametral to 2 inch Circular pitch.
F. H. BULTMAN & CO.,
100-108 Canal St., CLEVELAND, O.

A large and growing circulation among machine shop and foundry firms, has
THE IRON TRADE REVIEW

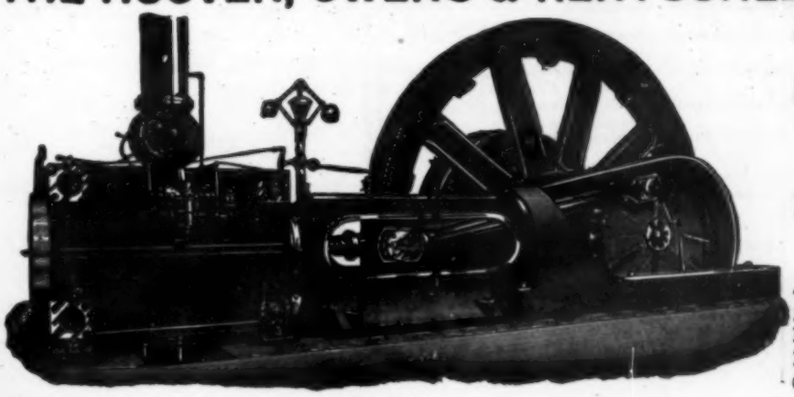
FORGINGS
JAS. H. BAKER MFG. CO., Pittsburg, Pa., U. S. A.



The Bucyrus Company, South Milwaukee, Wisconsin.
Steam Shovels and Dredges.
Placer Mining Machinery of the Elevator Bucket Type. Railroad Wrecking Cars and Pile Drivers. Centrifugal Dredging Pumps.

"Metallurgy of Cast Iron." Price $3.00.

THE HOOVEN, OWENS & RENTSCHLER CO., HAMILTON, O.

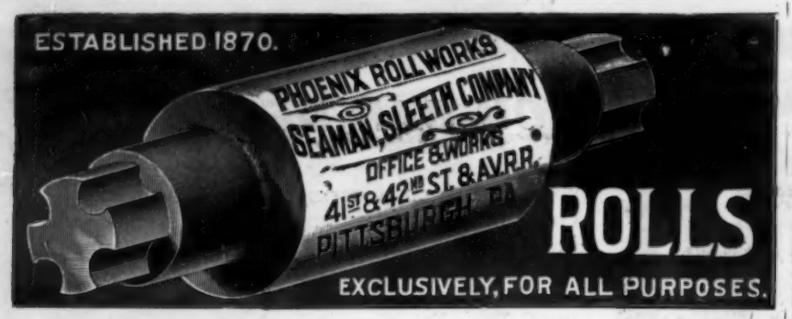


Hamilton Corliss Engines.

Engines for Rolling Mills, Electric Railways and Electric Light.

Engines of all sizes and for all purposes.

46 South Canal St., Chicago.
39 and 41 Cortlandt St., New York.
Lewis Block, Pittsburgh, Pa.
Room A, Laclede Bldg., St. Louis, Mo.
C. C. Moore & Co., San Francisco, Cal.



A. Garrison Foundry Co..

PITTSBURG, PA.

MANUFACTURERS OF

SAND and CHILLED ROLLS, and ROLLING MILL CASTINGS

of every description.

AETNA & CORLISS ROLLING MILL ENGINES
THE TOTTEN & HOGG IRON & STEEL FOUNDRY CO.
OFFICE & WORKS
24TH ST. & A.V.R.R.
PITTSBURGH, PA.
PINIONS, CHILLED & SAND ROLLS.
ROCK CRUSHERS
ROLLING MILL & TIN PLATE MILL MACHINERY

THE LORAIN FOUNDRY COMPANY,

Lorain, Ohio.

SAND AND CHILLED ROLLS.

Heavy Iron Castings in Loam, Dry and Green Sand, Made from Cupola or Air Furnace...

BRASS AND COPPER CASTINGS.

"Metallurgy of Cast Iron," Second Edition.

By THOS. D. WEST; 107 engravings, 583 pages. Just issued. A valuable work to Founder, Molder, Draughtsman, Designer, Technical School Specialist. Chemistry of Iron; cheapening of mixtures; the effect of the metalloids in changing the grade of iron; latest improvements in cupola construction and practice—all are fully covered. Price $3. Sent post-paid on receipt of price, by *The Iron Trade Review Co.*, Cleveland, Ohio 1522 Monadnock Block, Chicago, Ill.

The man who whispers down a well,
About the things he has to sell,
Won't reap the golden dollars,
Like one who climbs a tree and—hollers.—Ex.

The Iron Trade Review is the best trade advertising medium in the Central West.

Has the largest paid circulation in its territory.

WRITE FOR RATES.

DEAD

The mail matter which does not reach the right people is dead. It does no one any good. It has wasted your postage.

Penton's Foundry List,

corrected to January 1st of the current year, contains the names and addresses of all the iron and steel foundries in the United States. These represent a very large percentage of the buying constituency of the country.

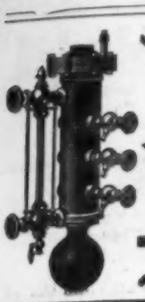
You may now be sending out letters calculated to reach these people. The chances are they do not. It is also a safe proposition to gamble that they do not reach them all.

When you count your loss in not covering the trade thoroughly and addressing others who are not interested in your product, the value of such a book as Penton's Foundry List is apparent.

A Ten Dollar Bill pays for it.

The Iron and Steel Press Co

CLEVELAND, OHIO.



The Wright

Safety Water Column.
Steam Separator.
Exhaust Pipe Head.
Steam Trap.

These goods are unchanged in either the internal mechanism or external appearance, and all patent litigation is ended by the change of names.

THE WRIGHT MFG. CO.
Write for discounts.
RIGHT { In principle. In price.
70-80 Mason st. CLEVELAND, O.

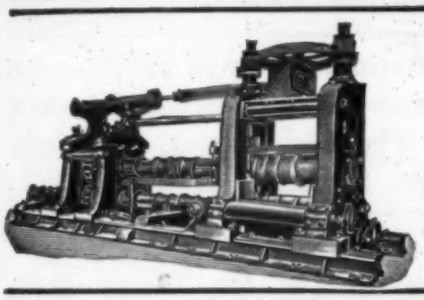
FRANKFORD STEEL & FORGING CO.,
Ellwood City, Lawrence County, Pa.
Office, Fidelity Mutual Bldg., Philadelphia. Chicago Office A. M. Castle & Co., 54 S. Canal St. Boston Office, Harrington, Robinson & Co., 272 Franklin St.

STEEL FORGINGS
Railroad, Marine and Machine. All Shapes. Heavy Shafting. In the rough, rough turned or finished.

WEST PENN FOUNDRY & MACHINE CO.,
AVONMORE, PA.

Manufacturers of
TIN, SHEET AND BAR MILL PLANTS.
Blast furnace work. Steel work. Hydraulic machinery. General castings of every description.

THE SUMMIT WIRE CO.
CUYAHOGA FALLS, OHIO.
Manufacturers of
WIRE
TINNED { BROOM WIRE, MATTRESS WIRE, LANTERN WIRE,
BRIGHT MARKET WIRE,
COPPERED MARKET WIRE,
ANNEALED STONE WIRE.
WIRE STRAIGHTENED AND CUT TO LENGTHS.



Frank-Kneeland Machine Co.
54th St., PITTSBURG, PA.
CHILLED, SAND AND STEEL **Rolls.**
ROLLING MILL MACHINERY.

Canton Roll & Machine Company, Canton, Ohio.
MANUFACTURERS OF
Chilled, Sand and Semi-Steel Rolls.
Rolling Mill and Tin Plate Machinery.
HEAVY CASTINGS OF EVERY DESCRIPTION.
ESTIMATES FURNISHED FOR COMPLETE PLANTS.

...A B C OF IRON..

A book for foundrymen. It is issued in cloth binding, and gives much valuable matter on how to reduce cost of mixtures, and on grading and numbering of pig iron.
CHAPTER HEADINGS:—Iron—What is it? Pig Iron. Constituents of Iron. Numbering of Pig Iron. Grading of Iron. How to reduce cost of mixture. Steel, Physical Properties of Metals Defined. Statistics. Early History and Manufacture of Iron.
Former Price, $2.00. NOW $1.00.
Sent, postpaid, on receipt of price, by
THE IRON TRADE REVIEW CO.,
CHICAGO. CLEVELAND PITTSBURG

Jenkins Brothers' Valves
are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the BEST ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with Trade Mark like cut. (1)
JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

DIXON'S
Pure Flake Graphite,
THE PERFECT LUBRICANT.
Sample and Pamphlet Free.
JOSEPH DIXON CRUCIBLE COMPANY, JERSEY CITY, N. J.

Subscribe for THE IRON TRADE REVIEW

When writing to advertisers please mention The Iron Trade Review.

MACHINERY

Second-Hand—First-Class Order

25-lb. Bradley Hammer.
50-lb. Power Hammer (Dinelt & Eisenhardt.)
45-lb. Drop Hammer.
76-lb. Drop Hammer—4 poppets.
98-lb. Drop Hammer—3 poppets.
123-lb. Drop Hammer—4 poppets.
224-lb. Drop Hammer.
800-lb. Pratt & Whitney board lift, automatic Drop Hammer.
4 to 6 in. Curtis Pipe Machine, hand and power.
No. 5½ Merrell Pipe Machine, 1 to 4-in., hand and power.
2-in. Eaton Cole & Burnham Pipe Machine.
Single Spindle Garvin Profiler.
14-in. Brown & Sharp Screw Machine, friction geared head, without wire feed.
18-in. Davis & Egan M. T. Co. Screw Machine, friction geared head, chard turret and wire feed.
Screw Machine, Lodge & Davis M. T. Co., ⅝-in. capacity through wire feed.
No. 2 Reed Plain Milling Machine, back geared.
No. 3 Garvin Hand Miller.
No. 3 Plain Cincinnati Miller with all power feeds.
9-in. Star Screw Cutting Lathe, foot power.
11-in. Barnes Screw Cutting Lathe, foot power.
26-in. x 12-ft. New Haven Lathe.
30-in. x 22 ft. " " "
24 in. x 20-ft. " " "
26-in. New Haven Drill, B. G., p. f. and q. r.
10 in. D'Amour & Littledale sensitive drill on column.
13 in. Dwight Slate Sensitive Drill on column.
18-in. Prentice Drill with Chuck.
No. 1 Davis Keyseater.
80 light Dynamo, with rheostat and volt meter.
Woodward & Rogers Horizontal Tapping Machine.
6 in. Boynton & Plummer Crank Shaper.
16-in. Lodge, Davis & Co. Crank Shaper.
No. 5 punch and shear combined, Long & Allstatter.
30x30x8 Whitcomb Planer.
38x38x8 ft. Cove "
36x36x12 ft. Wilson " with two heads.
Write us for machinery wanted, also if you wish to sell or exchange.

C. C. WORMER MACHINERY CO.,
20 to 36 Shelby St., Detroit, Mich.

New and Second-Hand Machinery.

Immediate Delivery.

1 Lathe 84 in., 28 ft. bed.
1 " 46 in., 17 ft. bed.
1 " 30 in., 15 ft. bed.
1 Locomotive Axle Lathe.
1 28 in. Back Gear Drill Press.
1 Betts Boring Mill, 10-16 ft.
1 Niles Boring Mill, 4 ft.
1 Betts Planer 110 x 110 x 18 ft., 2 heads.
1 Bond Planer, 48 x 48 x 12 ft., 3 heads.
1 Sellers Planer, 57 x 52 x 23 ft., 3 heads.
1 Sellers Planer 36 x 36 x 13½ ft., 1 head.
2 Sellers Planers 28 x 28 x 6 ft., 1 head.
1 Sellers Planer, 24 x 24 x 6 ft., 1 head.
1 Sturtevant Monogram Blower No. 10.
1 3,000 lb. Double Frame Steam Hammer.
1 3,500 lb. " " " "
1 Pipe Machine, 6 in. capacity.
2 Large Alligator Shears.
1 Atlas Automatic Engine, 7 x 10.
1 Hoisting Engine and Boiler.
8 Boilers 72 x 18 ft.
1 No. 3 Hilles & Jones 16 ft. Plate Planer.
1 Long & Alstatter Power Splitting Shear—cut ¾ plate.
1 Boiler Makers' Combined Punch and Shear, 36-in. throat.
2 50 kl. 1200 c. p. Arc Dynamos.
$10,000 stock of electric material; will trade for machine tools.

We buy and sell new and second-handmachine tools. Correspondence solicited. M. 2937. M. 1019.

The Pelton Engineering Co.,
16 Merwin St. CLEVELAND, O.

FOR SALE. MACHINERY.

Lathes, planers, shapers, drill presses, dynamos, gas and steam engines, boilers, tanks; everything, new and second-hand.

THE ATLAS MACHINE CO.,
26th St. Corner Liberty,
TELEPHONE 3510,
PITTSBURG, PA.

FOR SALE

A Three-fourths interest in an 80-acre Oil and Gas Lease in the Sandusky County Oil Fields, with five wells complete and in operation, one boiler, one engine, and two 200-barrel tanks, with a net daily production of eight barrels, or six barrels net to the three-fourths interest. Royalty one-sixth, with the usual Oil and Gas Lease complied with. Price $4,500 for the three-fourths interest.
C. A. SCHUBERT, Fostoria, Ohio.

☞ Molder's Text Book, Price $2.50 ☜

FOR SALE.

SECOND-HAND TOOLS

IMMEDIATE DELIVERY.

2 12" x 5' Silk Lathes.
1 Grant Worm Hobbing Machine.
1 No. 3 Brown & Sharpe Cutter and Reamer Grinder.
1 No. 1 Diamond Universal Grinder.
1 No. 1 Mitts & Merrill Keyseat Milling Machine.
1 No. 2 " " " " "
All of the above machines are practically as good as new.
1 18" Turret Lathe.
1 Heavy Gas Engine Countershaft.
Fly Wheels, Iron and Wood Pulleys, Blowers, etc.
Also complete stock of new Machine Tools.

Brown & Zortman Machinery Co.
Cor. Water and Wood Sts., PITTSBURG, PA.

WANTED.

An Enameler on cast iron. One thoroughly familiar with sanitary work and capable of producing fine ware can obtain a very desirable position by addressing
Box 241, care of Iron Trade Review, Cleveland, O.

BEAMS, CHANNELS, ANGLES, ZEES, PLATES.

2000 Tons in Stock.

Eye Beams, 4 inch to 20 inch, inclusive.
Channels, 4 inch to 15 inch, "
Equal Angles, 1¼ x 1¼ to 6 x 6, "
Unequal " 2½ x 2 to 6 x 4, "
Plates, ¼ inch thick and over.
Zees, 3 in., 4 in., 5 in. and 6 in.

All material in 50 to 70 ft. lengths or cut to specified lengths when desired. Shipments promptly on receipt of order Send for detail stock list.

THE FOREST CITY STEEL & IRON CO.,
Cleveland O.

Steam Shovels.

Steam Shovel Outfit for rent or would take contract on which same could be used.

Northern Ohio Paving & Construction Co
CLEVELAND, O.

RAILS.

NEW AND RELAYING RAILS.

350 tons, 16 lb. rails, new. 500 tons, 20 lb. rails, new. 300 tons, 25 lb. rails, new.
Also 30, 35, and 40 lb. rails, new. 1000 tons relaying rails, 60 to 75 lb. sections.
150 good relayers, 56 lb., with joints.

JOSEPH SCHONTHAL,
1221 Park Building, PITTSBURG, PA.

A. M. Crane & Company,

The Rookery, CHICAGO

Manufacturers of the Simplex Car and Track Jacks, and dealers in Pig Iron, Steel and Iron Bars, Springs and Wire.

FOR SALE.

The property of the Michigan Land and Iron Co., Lim., in Upper Peninsula of Michigan. Mines, mineral rights and timber for sale. For particulars, address
THE MICHIGAN LAND & IRON CO., Lim.,
MARQUETTE, MICH.

FOR SALE.

One second hand Putnam Engine 16-in x 42-in. described as follows: Cylinder 16-in. bore x 42 in. stroke; fly wheel 12 feet diameter x 25-in. face, in one piece; steam pipe connection 5-in.; engine develops 85 H. P., at 90 r. p. m., and is a very nice easy running engine, and can be seen and run at any time. Address
PLANO M'F'G CO.,
WEST PULLMAN, CHICAGO, ILL.

FOR SALE.

The plant now in operation, known as **The Bluefield Iron Works**, is offered for sale. It consists of a

Complete Foundry
Machine Shop,
Smith Shop and
Pattern Shop,

equipped with modern tools, and is doing a successful and profitable business. It gathers trade from the Pocahontas, Thacker, Davy and Tazewell coal fields, and a large lumber country. Good reason for selling. For terms and price, write to
WM. A. GATHER, Bluefield, W. Va.

Subscribe for
THE IRON TRADE REVIEW.

FOR SALE

16 and 25 pound Rails, I Beams, three 34 ft. by 24 inch and four 32 ft. by 15 inch plate and angle girders, 400 feet of 16-inch Cast Iron Pipe, three Steam Shovels, second-hand Boilers, Pipe and Machinery. Correspondence solicited.

J. B. JONES & CO.,
Wholesale Scrap Iron, Steel and Metals,
310 to 320 Morgan St., ALLEGHENY CITY, PA.

Manufacturing Site of Twenty Acres and Twenty-five Thousand Dollars Cash,

Payable in monthly installments, in seventeen months, to be used in the erection of buildings on the twenty acres. To any manufacturing company employing 300 to 500 men. This is one of the best manufacturing sites in Ohio, is accessible to three trunk lines of railway (with 1600 ft. track front) with all city conveniences. Contract can be made by the undersigned owner and responsible parties at once.
J. R. Burns, Kent, Ohio. Reference, City Bank, Kent, Ohio, or D. L. Rockwell, Mayor.
Address, **J. R. BURNS, Kent, Ohio.**

State size and amount of
WROUGHT
PIPE
wanted and we will quote prices. It costs you nothing and may save you much. We ship stock quoted promptly and therefore make prices only on exact specifications. AERMOTOR CO., Chicago Heights, Ill.

Ideal System of Water Purification

Installed by **THE PITTSBURG FILTER MFG. CO.**

100,000 Horse Power in use.

Carnegie Building, PITTSBURG, PA.
Telephone 2190.

Prompt Installation of all Work Guaranteed.

HYDE WATER TUBE SAFETY BOILERS.

Best for Utilizing Waste Heat from Heating Furnaces Puddling Furnaces, Blast Furnaces.

THE ONLY BOILERS WITH PERFECT CIRCULATION.

HYDE BROS & CO., PITTSBURGH, PA.

FOR CAR WORK

and all malleable work there are no stronger or more satisfactory irons than

"Pioneer" = "Antrim" = "Elk Rapids" = "Excelsior"

LAKE SUPERIOR CHARCOAL IRON.

Superior Charcoal Iron Co.,
911, 912, 913 Michigan Trust Bldg.,
GRAND RAPIDS, MICH.

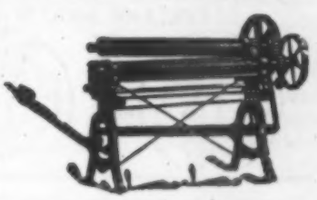
Machines for Working Sheet Metal

Patent Gap Shears.

General Purpose Punch and Shear—seven sizes.
General Purpose Forming Rolls—all sizes.
Tools for Boiler Shops, Machine Shops and general iron manufacturing industries.

Address

BERTSCH & CO., Cambridge City, Ind.



Second Edition Now Ready.

"METALLURGY OF CAST IRON"

By THOS. D. WEST; 107 engravings, 583 pages. Just issued A valuable work to Founder, Molder, Draughtsman, Designer Technical School Specialist. Chemistry of Iron; cheaping of mixtures; the effect of the metalloids in changing the grade of iron; latest improvements in cupola construction and practice—all are fully covered. Price $3. Sent postpaid on receipt of price, by *The Iron Trade Review Co.*, Cleveland, O; 1522 Monadnock Block, Chicago, Ill.

James M. Swank, author of "Iron in All Ages," and editor of the *Bulletin* of The American Iron & Steel Association, in reviewing "Metallurgy of Cast Iron," says it is "One of the most valuable publications relating to the manufacture of iron castings, that has ever, to our knolwedge been issued in this or any other country."

WANTED

A foundry in Chicago or vicinity to become interested in a new process for making grate bars, sash weights, coal hole castings, elevator weights, brake shoes and other articles on which there is no machine work. The plant at present engaged in this work is unable to supply the demand. The business will amount to from 30 to 50 tons per day and a profit of 50 per cent is guaranteed.

The foundry desiring this business must have sufficient capacity and capital to handle the trade. Would also make arrangements with parties who have the capital and are willing to build a plant and take care of it.

For further information address "**New Method,**" Box 511, care **The Iron Trade Review,** Cleveland, Ohio.

FOUNDRY COKE

Agents.
PINNICKINNICK COAL CO.
GENERAL HOCKING FUEL CO.
CONNELLSVILLE.
STONEGA.
POCAHONTAS.
72 HOUR FOUNDRY COKE.

O'GARA, KING & CO.
WESTERN UNION BLDG.
CHICAGO.

STANDARD BLOCK COAL CO.
····MINES IN No.8·····
PITTSBURG DISTRICT.
PIEDMONT.
CUMBERLAND.
BLOSSBURG.

SMITHING COAL

Every Mill Man
Should Keep Posted by Reading
Power and Transmission
a unique publication in trade literature exclusively devoted to
MODERN POWER TRANSMISSION ENGINEERING
copiously illustrated with typical installations. Other articles of interest to the up to date factory are also contained in each issue. Sample copy free by applying to
THE DODGE MANUFACTURING CO. ENGINEERS FOUNDERS MACHINISTS MISHAWAKA, IND. U.S.A.
BRANCHES ~ BOSTON NEW YORK CHICAGO CINCINNATI ATLANTA LONDON, ENG.

BE WISE BE WISE
THE GOBEILLE PATTERN CO
CLEVELAND OHIO U S A
BE WISE BE WISE

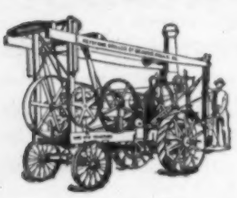
Any wood butcher can hang out his sign, advertise, and "make" patterns. We MANUFACTURE patterns. Our works is not a "shop" but a MILL and FACTORY. . . .

Note the distinction

The Balkwill Pattern Works,

WOOD PATTERNS
FOR CASTINGS.

970-972 Hamilton Street,
CLEVELAND, OHIO.



FOR TESTING IRON ORE BODIES
or drilling deep test holes in ANY formation—gravel, boulders and rock. Drives 4, 6, 8 or 10-inch pipe, or drills holes that size in rock, and
Produces at the Surface Everything Found.
Tests for gold, lead, zinc, coal—everything. Can be used on boat, to explore river beds to bed rock. Water no hindrance. Drills water and oil wells quickly, cheaply and without skilled labor. Self-moving: complete.
Write for full information and catalogue.
THE KEYSTONE DRILLER CO.,
BEAVER FALLS, PA., U.S.A.

Subscribe for The IRON TRADE REVIEW, $3 per year.

If you can get an abrasive wheel that does twice the work of the wheel you have been using—
If, in addition, the new wheel does its work in half the time of the old one—
And then, on top of that, does cleaner, better work, it ought to be a money-saving proposition, don't you think, even though the new wheel does cost a bit more in the first place?

Let us send you the Carborundum Catalogue.

THE CARBORUNDUM COMPANY,
NIAGARA FALLS, N.Y.

OF INTEREST TO
Manufacturers

Write for copy of pamphlet just issued by the
ILLINOIS CENTRAL R.R. COMPANY
giving reliable information concerning nearly 200 desirable locations for industries, and entitled
INDUSTRIAL SITES IN TEN STATES
Address GEO. C. POWER,
Industrial Commissioner, Illinois Central Railroad
Room 506, Central Station, CHICAGO, ILL.

Gray Iron and Brass Castings
Vincent Valve Co.,
SANDUSKY, O.